

ANNEXURE G:

Standard SANRAL Environmental Management Plan (EMPI) for Road Construction (Section C1001 to C1011)

and

Project Specific Environmental Management Programme (EMPr) for the Improvement and Resurfacing on National Route R67 Section 5 from Whittlesea (Km 0) to Queenstown (Km 32.98) (Section C1012)

Version 00

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STRUCTURE OF THE DOCUMENT

This document is structured in accordance with Appendix 4 of Government Notice R 982, dated 4 December 2014, in terms of the National Environmental Management Act (NEMA). The regulatory requirements are tabled below (left column) and details of how these components are covered in the document are also provided (right column).

Section C1001 to C1011 represents SANRAL's standard Environmental Management Plan (EMPI) with environmental management measures that typically apply to all road construction projects while Section C1012 represents the project specific Environmental Management Programme (EMPr). The project specific Environmental Management Programme (EMPr) focusses on environmental management measures unique to the specific project and environment in which the project is undertaken.

Requirements of Appendix 4 of Government Notice R 982	Reference to how this requirement was addresses in this document
(1) An EMPr must comply with section 24N of the Act and include -	-
(a) details of - (i) the <u>EAP</u> who prepared the EMPr; and (ii) the <u>expertise</u> of that EAP to prepare an EMPr, including a <u>curriculum vitae</u> ;	- Details of the EAP provided in Section C1012 (c) (i) Expertise of the EAP provided in Section C1012 (c) (ii) Summary curriculum vitae of the EAP provided in Section C1012 (c) (iii)
(b) a detailed description of the <u>aspects of the activity</u> that are covered by the EMPr as identified by the project description;	Project specific activities and aspects to be managed provided in Section C01012 (a) and (b)
(c) a <u>map</u> at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Maps of project area (road route) superimposed over sensitive areas provided in Section C1012 (d) and in the Basic Assessment Report.
(d) a description of the <u>impact management objectives</u> , including <u>management statements</u> , identifying the <u>impacts and risks</u> that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including	Impact management objectives and statements are provided for project specific aspects in table format for each aspect listed in Section C1012 (b). Impacts and risks for each aspect and the project phases these aspects relate to are also listed.
(i) planning and design;	None (completed).
(ii) <u>pre-construction</u> activities;	Not applicable (SANRAL current management practices for the R67 would apply).

Requirements of Appendix 4 of Government Notice R 982	Reference to how this requirement was addresses in this document
(iii) <u>construction</u> activities;	Impact management objectives and statements are provided for project specific aspects in table format for each aspect listed in Section C1012 (b). Impacts and risks for each aspect and the project phases these aspects relate to are also listed.
(iv) <u>rehabilitation</u> of the environment after construction and where applicable post closure; and	Impact management objectives and statements are provided for project specific aspects in table format for each aspect listed in Section C1012 (b). Impacts and risks for each aspect and the project phases these aspects relate to are also listed.
(v) where relevant, <u>operation</u> activities;	Not applicable (SANRAL current operational management practices for the R67 would apply).
(e) a <u>description and identification of impact management outcomes</u> required for the aspects contemplated in paragraph (d);	Impact management outcomes are provided for project specific aspects in table format for each aspect listed in Section C1012 (b).
(f) a description of proposed <u>impact management actions</u> , identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -	Standard SANRAL impact management actions are provided in (Section C1001 to C1011) Project specific impact management actions provided in Section C1012 (b) for project specific aspects that require management actions over and above those standard management actions in Section C1001 to C1011.
(i) avoid, modify, remedy, control or stop any action, activity or process which causes <u>pollution</u> or environmental <u>degradation</u> ;	As above.
(ii) comply with any prescribed environmental management <u>standards or practices</u> ;	As above.
(iii) comply with any applicable provisions of the Act regarding <u>closure</u> , where applicable; and	Not applicable.
(iv) comply with any provisions of the Act regarding <u>financial provisions</u> for rehabilitation, where applicable;	Not applicable.
(g) the <u>method of monitoring</u> the implementation of the impact management actions contemplated in paragraph (f);	Standard SANRAL monitoring is provided in (Section C1001 to C1011).

Requirements of Appendix 4 of Government Notice R 982	Reference to how this requirement was addresses in this document
(h) the <u>frequency of monitoring</u> the implementation of the impact management actions contemplated in paragraph (f);	Project specific monitoring provided in Section C1012 (b) for project specific aspects that require management actions over and above those standard management actions in Section C1001 to C1011.
(i) an indication of the <u>persons</u> who will be <u>responsible</u> for the implementation of the impact management actions;	Roles and responsibilities are outlined in Section C1004: ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS.
(j) the <u>time periods</u> within which the impact management actions contemplated in paragraph (f) must be implemented;	Time periods for management actions are provided in Section C1001 to C1012 for each environmental aspect discussed in, under individual headings "Frequency"
(k) the <u>mechanism for monitoring compliance</u> with the impact management actions contemplated in paragraph (f);	Monitoring mechanisms are listed in Section C1010 MONITORING AND RECORD KEEPING and Section C1012 (reference to SANRAL standard EMPI measures in Section C1010)
(l) a <u>program for reporting on compliance</u> , taking into account the requirements as prescribed by the Regulations;	Reporting programme outlined in Section C1010: MONITORING AND RECORD KEEPING
(m) an <u>environmental awareness plan</u> describing the manner in which -	Details and environmental awareness and training provided in Section C1005: TRAINING AND ENVIRONMENTAL AWARENESS PLAN
(i) the applicant intends to <u>inform his or her employees of any environmental risk</u> which may result from their work; and	
(ii) <u>risks must be dealt with</u> in order to avoid pollution or the degradation of the environment; and	
(n) any specific information that may be required by the competent authority.	None identified to date.

PART 1: SANRAL ENVIRONMENTAL MANAGEMENT PLAN (EMPI) FOR ROAD CONSTRUCTION ACTIVITIES



C1001 SCOPE

The South African National Roads Agency SOC Limited (SANRAL) recognises environmental management as a key component of road infrastructure development and as part of its environmental policy has developed this Environmental Management Plan (EMPI) as a tool for continual improvement in environmental performance.

This EMPI prescribes the methods by which proper environmental controls are to be implemented by the contractor. The duration over which the contractor's controls shall be in place cover the construction period of the project as well as the limited time after contract completion defined by the Conditions of Contract for Construction for Building and Engineering Works Designed by the SANRAL (1999 edition) published by the Federation Internationale des Ingenieurs-Conseils (FIDIC) as the Defects Notification Period (maintenance period).

The provisions of this EMPI are binding on the contractor during the life of the contract. They are to be read in conjunction with all the documents that comprise the suite of documents for this contract, particularly the conditions of any environmental authorisation and associated Environmental Management Programme (EMPr). In the event that any conflict occurs between the terms of the EMPI and the project specifications or environmental authorisation, the terms herein shall be subordinate.

The EMPI is a dynamic document subject to similar influences and changes as are brought by variations to the provisions of the project specification. Any changes to the EMPI and/or environmental authorisation cannot occur without being submitted to the SANRAL who will manage the process of amending the EMPI.

The EMPI identifies the following:

- Relevant parties and their responsibilities;
- Construction activities that will impact on the environment;
- Specifications with which the contractor shall comply in order to protect the environment from the identified impacts; and
- Actions that shall be taken in the event of non-compliance.

C1002 DEFINITIONS

Asphalt Plant: means a plant that produces asphalt for road, driveway or pathway surfacing by mixing aggregate, bitumen, and other additives to produce hot mixed asphalt and/or warm mix asphalt.

- **Temporary asphalt plants** means plants that are used for the sole purpose of supplying asphalt for a specific road paving contract not exceeding a period of 24 months. Temporary asphalt plants have been declared controlled emitters and have to comply with prescribed emission limits and requirements, as well as emission measurement and reporting requirements.
- **Permanent asphalt plants** require an atmospheric emission license and have to comply with prescribed emission standards. These plants are also considered a listed activity in the Environmental Impact Assessment Regulations of 2014 and therefore require an environmental authorisation subject to a scoping and environmental impact assessment.

Alien Vegetation: undesirable plant growth which includes, but is not limited to all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA), 1983 regulations. Other vegetation deemed to be alien are those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable.

Altering the bed, banks, course or characteristics of a watercourse: means any change affecting the resource quality or flow components within the riparian habitat or 1:100 year floodline, whichever is the greater distance from the watercourse.

Diverting the flow of a watercourse: means a temporary or permanent structure (i.e. a culvert or pipe or part of a bridge) causing the flow of water to be rerouted in a watercourse for any purpose.

Category 1 Critical Biodiversity Areas (CBA 1): critically endangered vegetation types or forest clusters.

Category 2 Critical Biodiversity Areas (CBA 2): endangered vegetation types and forest patches.

Construction Activity: any action taken by the contractor, his sub-contractors, suppliers or personnel during the construction process as defined in the contract documents.

Environment: the surroundings within which the contract exists and comprises land, water, atmosphere, micro-organisms, plant and animal life (including humans) in any part or combination thereof as well as any physical, chemical, aesthetic or cultural inter-relationship among and between them.

Environmental Aspect: any component of a contractor's construction activity that is likely to interact with the environment.

Environmental Approvals: includes the environmental authorisation (as defined below) as well as the environmental permits and licenses approved for the project, including any water use license or general authorisation issued in terms of the National Water Act, permits for the removal of protected species, or permits issued in terms of the National Heritage Resources Act.

Environmental Authorisation: a written statement from the National Department of Environmental Affairs, (DEA), with the general and specific conditions and the EMP_r recording its approval of an application for a planned undertaking that triggers listed activities in the Environmental Impact Assessment (EIA) regulations of the National Environmental Management Act (NEMA).

Environmental Impact: any change to the environment, whether desirable or undesirable, that will result from the effect of a construction activity. An impact may be the direct or indirect consequence of a construction activity.

Environmental Impact Assessment (EIA): a systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes basic assessment and scoping and environmental impact reporting.

Environmental Management Plan (EMPI): the SANRAL standard environmental management plan as contained in Section C1001 to C1011.

Environmental Management Programme (EMPr): the embodiment of this EMPI to ensure that undue or reasonably avoidable adverse impacts of a development are prevented, and to ensure that positive impacts are enhanced. It thus addresses the how, when, who, where and what of integrating environmental mitigation and monitoring measures through identified projects. Project specific measures are contained in Section C1012.

Indigenous Vegetation: refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless the level of alien infestation and were the topsoil has not been lawfully disturbed during the preceding 10 years.

Impeding the flow of a watercourse: means the temporary or permanent obstruction or hindrance to the flow of water in a watercourse by a structure (i.e. a culvert or pipe or part of a bridge) built either fully or partially in or across a watercourse.

Road Reserve: a corridor of land, defined by co-ordinates and/or proclamation, within which the road, including access intersections or interchanges, is situated. A road reserve may, or may not, be bounded by a fence.

Site: the site is defined in the FIDIC Conditions of Contract and in the scope of works. It is bound by the limits of construction as shown in the drawings or the title of the project and extends to also include the following:

- Areas outside the construction zones where accommodation of traffic is placed;
- All borrow pits defined in the applications approved by the relevant Department of Mineral Resources (DMR);
- All haul roads constructed by the contractor for purposes of access;
- Any non-adjacent sites specified in the contract documentation;
- The contractor's and his subcontractors' camp sites;

for the purposes of this EMPI includes areas outside of, but adjacent to, the road reserve that may be affected by construction activities;

Spoil material: is material unsuitable for construction of the road pavement and for which no other useful purpose can be found in additional works on the project (e.g. for the provision of protection berms). Such material requires spoiling at convenient areas to be identified by the engineer and/or contractor within the Site. Spoil material does not require removal to a designated landfill site unless it contains identifiable hazardous contaminants.

Subsoil: means the layer of soil immediately beneath the topsoil.

Topsoil: means the natural soil covering, including all the vegetation and organic matter. Depth may vary at each site.

Watercourse: means (a) a river or spring; (b) a natural channel in which water flows regularly or intermittently; (c) a wetland, lake or dam into which, or from which, water flows; and (d) any collection of water declared as a watercourse by the Minister, by notice in the Gazette, declare to be a watercourse. A reference to a watercourse includes, where relevant, its bed and banks. For the purpose of alteration of the bed banks, course or characteristics of a watercourse, the extend of a watercourse is defined as the area limited by either the outer edge of the riparian habitat or the 1:100 year flood line, whichever is the greatest.

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

C1003 LEGAL REQUIREMENTS

(a) General

Construction shall be according to the best industry practices, as identified in the project documents. The SANRAL standard EMPI for road construction (Section C1001 to C1011 of this document) and the project specific EMPr (Section C1012 of this document), which forms an integral part of the contract documents, informs the contractor as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by

construction activities associated with the project. The contractor should note that obligations imposed by the EMPI and EMPr as well as the conditions stipulated in the environmental authorisation and other environmental approvals for the project are legally binding in terms of this contract. In the event that any rights and obligations contained in this EMPI and EMPr contradict those specified in the standard or project specifications then the latter shall prevail.

(b) Statutory and other applicable legislation

The contractor is deemed to have made himself conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract.

Major environmental legislation, as amended from time to time, includes but is not limited to the following:

(i) Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA)

This act provides for control over the utilisation of the natural agricultural resources of South Africa in order to promote the conservation of soil, water sources and vegetation, as well as combating weeds and invader plants.

(ii) The Constitution Act (No 6 of 1996)

The Constitution states that everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected through reasonable legislative and other measures to prevent pollution and ecological degradation; promote conservation and ensure ecologically sustainable development and use of natural resources.

(iii) Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA)

This act makes provision for equitable access to, and sustainable development of, minerals and petroleum resources.

(iv) National Environmental Management Act (No. 107 of 1998) (NEMA)

This act supports the Bill of Rights within the Constitution and highlights principles of sustainable development including preservation of ecosystems and biological diversity and avoidance, minimisation and remediation of pollution and environmental degradation. It also sets the stage for the EIA Regulations.

(v) National Environmental Management: Air Quality Act (No. 39 of 2004) (NEMAQA)

This act provides reasonable measures for the prevention of pollution and ecological degradation; and provides for specific air quality measures; for national norms and standards regulating air quality monitoring, management and control by all spheres of government.

(vi) National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEMBA)

This act makes provisions to accomplish the objectives of the United Nations' Convention on Biological Diversity. SANRAL may be required to apply for permits to conduct certain listed activities which, together with the listed threatened or protected species, may be identified by the Minister.

Section 73 (3) of this act empowers a competent authority to direct a person to take steps to remedy any harm to biodiversity resulting from the actions of that person or as a result of occurrence of listed invasive species occurring on land on which that person is the owner. Thus SANRAL may be directed to remedy harm caused by listed invasive species.

(vii) National Environmental Management: Protected Areas Act (No. 57 of 2003) (NEMPAA)

This act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes and seascapes.

(viii) National Environmental Management: Waste Act (No. 59 of 2008) (NEMWA)

This act aims to regulate waste management practices through provision of national norms and standards, specific waste measures, licensing and control of waste activities, remediation of contaminated land as well as providing for compliance and law enforcement.

(ix) National Forests Act (No. 84 of 1998) (NFA)

This act makes provision for promoting the sustainable management and development of forests, and for the protection of certain forests and trees for environmental, economic, educational, recreational, cultural, health and spiritual purposes.

(x) National Heritage Resources Act (No. 25 of 1999) (NHRA)

This act provides for an integrated and interactive system for identification, assessment and management of South Africa's heritage resources, and empowers civil society to nurture and conserve their heritage resources.

(xi) National Water Act (No. 36 of 1998) (NWA)

This act makes provision for the protection of surface water and groundwater and their sustainable management for the prevention and remediation of the effects of pollution, as well as for the management of emergency situations.

C1004 ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS

Copies of this EMPI and EMPr as well as the environmental approvals for the project shall be kept at the site office and must be distributed to all senior contract personnel who shall familiarise themselves with its contents.

Implementation of this EMPI and EMPr as well as the conditions of the environmental authorisations and other environmental approvals requires the involvement of several stakeholders, each fulfilling a different but vital role as outlined herein, to ensure sound environmental management during the construction phase of a project.

(a) SANRAL (The Applicant)

SANRAL, as the holder of the environmental authorisation and other environmental approvals, is responsible for ensuring compliance with the EMPI and EMPr and the conditions of the environmental authorisation and other environmental approvals for the project.

SANRAL and anyone acting on SANRAL's behalf is accountable for the potential environmental impacts of any activities that are undertaken and is responsible for managing these impacts.

(b) The Engineer

The engineer has been appointed by, and acts for, SANRAL as its on-site implementing agent and carries the responsibility to ensure that the contractor undertakes its construction activities in such a way that SANRAL's environmental responsibilities are not compromised.

The engineer will, within seven days of receiving a contractor's request for approval of a nominated Designated / Dedicated Environmental Officer (DEO), approve, reject or call for more information on

the nomination. The engineer will be responsible for issuing instructions to the DEO where environmental considerations call for action to be taken.

If in the opinion of the engineer the DEO is not fulfilling his/her duties in terms of this EMPI, the engineer may, after discussion and agreement with SANRAL, exercise his powers under FIDIC general condition of contract and instruct replacement of the DEO in writing and with stated reasons.

(c) The Contractor

The contractor is responsible for project delivery in accordance with the prescribed specifications, among which this EMPI and EMPr and the conditions of the environmental authorisations and other environmental approvals shall be included.

The contractor shall receive and implement any instruction issued by the engineer relating to compliance with the EMPI and EMPr including the removal of personnel or equipment.

Compliance with the provisions contained herein or any condition imposed by the environmental approvals shall become the responsibility of the contractor through an approved Designated Environmental Officer (DEO). The contractor shall nominate a person from among his site personnel to fulfil this function and submit to the engineer for his approval the *curriculum vitae* of the proposed DEO. This request for approval shall be given, in writing, at least fourteen days before the commencement of any construction activity clearly setting out reasons for the nomination, and with sufficient detail to enable the engineer to make a decision.

(d) The Designated/Dedicated Environmental Officer (DEO)

Once a nominated representative of the contractor has been approved he/she shall become the DEO and shall be the responsible person for ensuring that the provisions of this EMPI are complied with during the life of the contract. The DEO shall submit regular written reports to the engineer, but not less frequently than once a month.

The DEO may undertake other construction duties unless the Appendix to Tender prescribes this position as 'dedicated' as opposed to the standard position being 'designated'. However, the DEO's environmental duties shall hold primacy over other contractual duties and the engineer has the authority to instruct the contractor to reduce the DEO's other duties or to replace the DEO if, in the engineer's opinion, he/she is not fulfilling his/her duties in terms of the requirements of this EMPI and EMPr. Such instruction will be in writing clearly setting out the reasons why a replacement is required.

As a minimum the DEO shall have an accredited diploma qualification in environmental or natural sciences or equivalent. Alternatively, the DEO shall have a minimum of 2 years' experience in a similar role in construction or other environmental regulatory field.

In addition to the compliance duties relating to EMPI the DEO shall also provide full cooperation whenever the contractor is subjected to regular environmental audits.

The project specific EMPr (section C1012) stipulates details of whether a Designated or Dedicated Environmental Officer is required for the project.

(e) Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is an independent environmental specialist appointed by the engineer to objectively and regularly monitor the contractor's compliance with the conditions of the authorisations issued for the project and the approved EMPr (that is this EMPI augmented with specifics of the project). These are external audits and the regularity is determined by the environmental authorisations.

C1005 TRAINING AND ENVIRONMENTAL AWARENESS PLAN

(a) DEO

The (DEO) shall have the minimum qualifications as prescribed above, and must be conversant with all legislation pertaining to the environment applicable to the contract. He/she must be appropriately trained in environmental management and possess the skills necessary to impart environmental management skills to all personnel involved in the contract.

(b) Employees

The contractor shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees.

Apart from environmental training induction, training should, as a minimum, include the course content below and no induction or course should be given until the engineer has been afforded the opportunity to appraise it and provide comment.

- (i) The importance of conformance with all environmental policies and the consequences of departure from standard operating procedures;
- (ii) Environmental risks and impacts, actual or potential, caused by work activities, prevention measures to avoid them and mitigation measures when they occur;
- (iii) Work force roles and responsibilities in achieving conformance with the environmental policy and procedures, including emergency preparedness and response requirements;
- (iv) The environmental benefits of improved personnel performance;
- (v) Avoidance of potential harmful effects on vegetation; and
- (vi) Proper manner for disposal of all wastes.

In the case of permanent staff the contractor shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the contractor shall inform the engineer when and how he intends concluding his environmental training obligations.

C1006 ACTIVITIES/ASPECTS CAUSING IMPACTS

Typical environmental aspects and impacts associated with road construction are listed in Table 1: *Aspects and Impacts Associated with Road Construction*. Actual impacts will differ from project to project and, therefore, so may the mitigation measures employed. The commonest aspects and impacts are addressed separately and typical avoidance and/or mitigation measures described. The list and descriptions are not by any means exhaustive and they shall be used for guideline purposes only. Project specific aspects and mitigation measures for the project are described in Section C1012.

Table 1: Aspects and Impacts Associated with Road Construction

Aspect	Impact
Waste generation/storage	Water pollution; nuisance; visual impact
Water use and stormwater discharge	Change in flow regime and/or reduction in downstream availability; soil erosion: water pollution

Vehicle use and maintenance	Air pollution; noise
Chemical/fuel storage	Water/air/soil pollution; health impacts; accidents e.g. slips, fire
Site clearing; earthworks; layer-works; seal works	Change in landform; impact on heritage resources; noise; soil erosion; air pollution
River bridges; installing drainage structures	Water pollution; impact on river flows; noise
Land acquisition	Loss of land &/or livelihood; change in land use;
Acquisition of building material from borrow pits	Change in landform and use

(a) General approach

The role of the DEO cannot be underestimated and once approved he/she shall be on the site at all times, and before the contractor begins each construction activity he/she shall give to the engineer a written statement setting out the following:

- (i) The type of construction activity about to be started.
- (ii) Locality where the activity will take place.
- (iii) Identification of the environmental aspects and impacts that might result from the activity.
- (iv) The methodology of impact prevention for each activity or aspect.
- (v) The methodology of impact containment for each activity or aspect.
- (vi) Identification of the emergency/disaster potential for each activity (if any) and the reaction procedures necessary to mitigate impact severity.
- (vii) Treatment and continued maintenance of impacted environment.

The contractor shall programme his work in such a way that each cause and effect of a construction activity is also identified and the activity planned so as to prevent any impact from happening and shall demonstrate that he is capable of carrying out any repair and reinstatement of the damaged environment. These requirements shall be concurrent with the time constraints to produce method statements for each construction activity in compliance with the provisions of these project specifications.

The contractor shall provide such information in advance of any or all construction activities provided that new submissions shall be given to the engineer whenever there is a change or variation to the original.

The engineer may provide comment on the methodology and procedures proposed by the DEO, but he shall not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the contractor shall demonstrate at inception and at least once during the contract that the approved measures and procedures function properly.

(b) Spillages

Streams, rivers and dams shall be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous products. In the event of a spillage, the contractor shall be liable to arrange for professional service providers to clear the affected area.

Responsibility for spill containment and treatment (whether hazardous or not) lies with the contractor. The individual causing a spill, or who discovers a spill, must report the incident to his/her DEO or to the engineer. The DEO will assess the situation in consultation with the engineer and act as required. In all cases, the immediate response shall be to contain the spill. The exact treatment of polluted soil / water shall be determined by the contractor in consultation with the DEO and the engineer. Areas cleared of hazardous waste shall be re-vegetated according to the engineer's instructions.

Should water downstream of the spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice will be sought for appropriate treatment and remedial procedures to be followed. The requirement for such input shall be agreed with the engineer. The costs of containment and rehabilitation shall be for the contractor's account, including the costs of specialist input as well as the sampling and testing of the water quality upstream and downstream of the spill. Water quality sampling and testing, and further treatment shall continue until upstream and downstream results correspond with each other.

(c) Water use and control

The contractor's use of water shall take into consideration that it is a scarce commodity, and shall be optimised. Authorisation shall be obtained from the Department of Water and Sanitation (DWS) before water is drawn from streams or new boreholes developed.

The contractor shall also ensure that any activities involving altering the bed, banks, course or characteristics of a watercourse, and diverting or impeding the flow of a watercourse are undertaken in such a manner that the impact on the environment is minimised. Method statements shall be submitted to the engineer for comment, detailing how the work will be undertaken, what risks are foreseen and what measures will be employed to minimise such risks.

Notwithstanding any comments by the engineer, no work involving altering the bed, banks, course or characteristics of a watercourse or diverting or impeding the flow of a watercourse can commence without written approval from DWS, unless a General Authorisation is applicable and notification to DWS is submitted.

The quality, quantity and flow direction of any surface water runoff shall be established prior to disturbing any area for construction purposes. Cognisance shall be taken of these aspects and incorporated into the planning of all construction activities. Before a site is developed or expanded, it shall be established how this development or expansion will affect the drainage pattern. Recognised water users / receivers shall not be adversely affected by the expansion or re-development. No water source shall be polluted in any way due to proposed changes.

Streams, rivers, pans, wetlands, dams, and their catchments shall be protected from erosion and from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous products.

The contractor shall submit to the engineer his proposals for prevention, containment and rehabilitation measures against environmental damage of the identified water and drainage systems that occur on the site. Consideration shall be given to the placement of sedimentation ponds or barriers where the soils are of a dispersive nature or where toxic fluids are used in the construction process. The sedimentation ponds must be large enough to contain runoff so that they function properly under heavy rain conditions up to 1:5 year severity.

The contractor shall submit to the engineer the results of the baseline water quality test taken above and below the site of the proposed activity; and thereafter monthly testing results or at the frequency as may be specified by the Water Use Licence where applicable. No taking-over can be authorised until the water quality is shown to be at pre-construction levels or better.

(d) Vegetation management

The contractor shall be responsible for the management of vegetation by protection of indigenous vegetation, especially identified protected species, and the prevention of alien vegetation germinating in areas disturbed by road construction activities within and outside the road reserve. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for or from road construction has been stored temporarily. This responsibility shall continue for the duration of the defects notification period. The project specific EMP in Section C1012 gives instructions regarding the removal of CARA-listed category 1 and 2 alien species and planting of specified indigenous species.

(e) Dust control

Dust caused by construction activities shall be controlled by means such as water spray vehicles and applied at sufficient frequency so as not to cause nuisance to adjacent habitation or affect farming activities or natural vegetation. Vegetation cover should also be kept for as long as possible to reduce the area of exposed surfaces. Dust emissions from batching and screening plants shall be subject to the relevant legislation and shall be the subject of inspection by the relevant authorities.

(f) Noise control

The contractor shall endeavour to keep noise generating activities to a minimum. Noises that could cause a major disturbance, for instance blasting and crushing activities, should only be carried out during the hours prescribed by the conditions of contract (i.e. normal hours). Should such noise generating activities have to occur at any time outside normal hours the people in the vicinity of the noise-generating activity shall be warned about the noise well in advance and the activities kept to a minimum. Relevant legislation shall also be taken into consideration, and any practical mitigation measures adopted. No noise generating activity outside of normal hours, regardless of its proximity to residences, can take place without application to the engineer for approval. The application shall be accompanied by the noise containment measures proposed.

(g) Energy consumption

The contractor shall take into consideration the impacts of high energy consumption, both from a cost and emissions point of view. Energy use shall be minimised, and where possible, alternative energy sources such as solar utilised.

The contractor shall undertake a study of the consumption of carbon units his chosen method of construction produces in the execution of his programme. In conjunction with the engineer who will provide complete cooperation in this study, a month by month output shall be compiled and efforts made to see how these outputs can be curtailed and reduced.

C1007 ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES

The contractor shall undertake “good housekeeping” practices during construction as stated in the COLTO Standard Specifications for Roads and Bridges and the FIDIC conditions of contract. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods that leaves production in a safe state from the ravages of weather to include the care for and preservation of the environment within which the site is situated.

The construction activities addressed below shall become part of the contractor's obligations regarding his programme of work and incorporated into the required method statements for workmanship and quality control.

(a) Site establishment

i) Site Plan

The site refers to an area with defined limits on which the project is located. The contractor shall establish his construction camps, offices, workshops, staff accommodation and testing facilities on the site in a manner that does not adversely affect the environment. However, before any site establishment can begin, the contractor shall submit to the ECO for his/her comments and to the engineer for his approval, plans of the exact location, extent and construction details of these facilities and the impact mitigation measures the contractor proposes to put in place.

The plans shall detail the locality as well as the layout of the waste management facilities for litter, kitchen refuse, sewage and workshop-derived effluents. The site offices should not be sited in close proximity to steep areas, as this will increase soil erosion. Preferred locations would be flat areas along the route. If the route traverses water courses, streams and rivers, it is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles are located as far away as possible from any water course. No camp establishment, including satellite camps, can be placed within 150 metres of an identified wetland unless the contractor has applied to DWS and received authorisation to do so. Regardless of the chosen site, the contractor's intended mitigation measures shall be indicated on the plan. The site plan shall have been submitted and approved before establishment commences. Detailed, electronic colour photographs shall be taken of the proposed site before any clearing may commence. These records are to be kept by the ECO and the engineer for consultation during rehabilitation of the site in order that rehabilitation is, as a minimum, done to a standard similar to pre-construction activities.

ii) Vegetation

The contractor has a responsibility to inform his staff of the need to be vigilant against any practice that will have a harmful effect on vegetation.

The natural vegetation encountered on the site is to be conserved and left as intact as possible. Vegetation planted at the site shall be indigenous and in accordance with instructions issued by the engineer. Only trees and shrubs directly affected by the works, and such others as may be indicated by the engineer in writing, may be felled or cleared. In wooded areas where natural vegetation has been cleared out of necessity, the same species of indigenous trees as were occurring shall be re-established. Protected trees may not be removed without a permit from the Department of Agriculture, Forestry and Fisheries.

Contravention of a notice of listed protected tree species under the National Forests Act, 1998 is regarded as a first category offence that may result in a fine or imprisonment for a period up to three years, or to both a fine and imprisonment. The DEO must be conversant with the latest gazette of declared protected trees.

Rehabilitation shall be undertaken using only indigenous tree, shrub and grass species. Special attention shall be given to any search and rescue operation identified during the environmental assessment process, and any removal to an onsite nursery for continuous nurturing and protection and later replanting.

Any proclaimed weed or alien species that propagates during the contract period shall be cleared by hand before seeding.

Fires shall only be allowed in facilities or equipment specially constructed for this purpose. The need for a firebreak shall be determined in consultation with the Engineer and the relevant authorities, and if required a firebreak shall be cleared and maintained around the perimeter of the camp and office sites.

iii) Water management

Water for human consumption shall be available at the site offices and at other convenient locations on site.

All effluent water from the camp / office sites shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water sources (streams, rivers, pans, dams etc.). Only domestic type wastewater shall be allowed to enter this system.

iv) Heating and cooking fuel

The contractor shall provide adequate facilities for his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

(b) Sewage management

Particular reference in the site establishment plan shall be given to the treatment of sewage generated at the site offices, site laboratory and staff accommodation and at all localities on the site where there will be a concentration of labour. Sanitary arrangements should be to the satisfaction of the engineer, the local authorities and legal requirements.

Safe and effective sewage treatment will require one of the following sewage handling methods: septic tanks and soak-aways, dry-composting toilets such as "enviro loos", or the use of chemical toilets which are supplied and maintained by a specialist service provider. The type of sewage management will depend on the geology of the area selected, the duration of the contract and proximity (availability) of providers of chemical toilets. Should a soak-away system be used, it shall not be closer than 800 metres from any natural water course or water retention system. The waste material generated from these facilities shall be serviced on a regular basis. The positioning of the chemical toilets shall be done in consultation with the engineer.

Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on the works. Use of the veld for this purpose shall not, under any circumstances, be allowed.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. The toilets shall also be placed outside areas susceptible to flooding. The contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such latrines in a clean, orderly and sanitary condition to the satisfaction of the Engineer.

(c) Waste management

The contractor's intended methods for waste management shall be outlined and implemented at the outset of the contract, and shall be to the satisfaction of the engineer. Opportunities for avoiding, reducing, reusing and recycling of materials should be identified upfront, as should constraints for their implementation. All personnel shall be instructed to dispose of all waste in the proper manner.

i) Solid waste

Solid waste shall be stored in an appointed area in covered, tip-proof metal drums or similar container for collection and disposal. Disposal of solid waste shall be at a licensed landfill site or at a site approved by the relevant authority in the event that an existing operating landfill site is

not within reasonable distance from the project area. No waste shall be burned or buried at or near the project area.

ii) Litter

No littering by construction workers shall be allowed and particular emphasis on litter control measures shall apply at stop/go facilities.

During the construction period, the various contractors' facilities shall be maintained in a neat and tidy condition and the site shall be kept free of litter. At all places of work the contractor shall provide litter collection facilities for later safe disposal at approved sites.

iii) Hazardous waste

Hazardous waste such as oils shall be disposed of at an approved landfill site. Special care shall be taken to avoid spillage of bitumen products such as binders or pre-coating fluid to avoid water-soluble phenols from entering the ground or contaminating surface water.

Under no circumstances shall the spoiling of bituminous products on the site, over embankments, in borrow pits or any burying, be allowed. Unused or rejected bituminous products shall be returned to the supplier's production plant. Any spillage of bituminous products shall be attended to immediately and affected areas shall be promptly reinstated to the satisfaction of the engineer.

iv) Construction and demolition waste

The opportunity for recycling and reuse of construction and demolition waste as fill for road embankments, land reclamation and drainage control must first be explored and take priority before the option of declaring these materials a 'waste'.

The contractor is encouraged to actively engage with authorities and landowners adjacent to the site and identify where such 'waste' materials can be usefully deployed to repair existing environmentally damaged areas such as erosion dongas.

(d) Control at the workshop

The contractor's management and maintenance of his plant and machinery will be monitored according to the criteria given below:

i) Hazardous Material Storage

Petrochemicals, oils and identified hazardous substances shall only be stored under controlled conditions. All hazardous materials such as bitumen binders shall be stored in a secured, appointed area that is suitably fenced, bunded and has restricted entry. Storage of bituminous products shall only take place using suitable containers to the approval of the ECO and the engineer.

The contractor shall provide proof to the engineer that relevant authorisation to store such substances has been obtained from the relevant authority. In addition, hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure. Before containment or storage facilities can be erected the contractor shall furnish the engineer with details of the preventative measures he proposes to install in order to mitigate pollution of the surrounding environment from leaks or spillage. The preferred method shall be a concrete floor that is bunded. Any deviation from the method will require proof from the relevant authority that the alternative method proposed is acceptable to that authority. The proposals shall also indicate the emergency procedures in the event of misuse or spillage that will negatively affect an individual or the environment.

ii) Fuel and gas storage

The contractor shall take cognisance of the limits set by legislation for the storage of fuels and acquire the necessary authorisation for storage capacity beyond these. An adequate bund wall, 110% of volume, shall be provided for fuel and diesel areas to accommodate any leakage spillage or overflow of these substances. The area inside the bund wall shall be lined with an impervious lining to prevent infiltration of the fuel into the soil. Any leakage, spillage or overflow of fuel shall be attended to without delay.

Gas welding cylinders and LPG cylinders shall be stored chained in a secure, well-ventilated area exterior to any building wall.

iv) Oil and lubricant waste

Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank and sent back to the supplier. Water and oil should be separated in an oil trap. Oils collected in this manner, shall be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials. Oil collected by a mobile servicing unit shall be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company.

All used filter materials shall be stored in a secure bin for disposal off site. Any contaminated soil shall be removed and replaced. Soils contaminated by oils and lubricants shall be collected and disposed of at a facility designated by the local authority to accept contaminated materials.

(e) Clearing the site

In all areas where the Contractor intends to, or is required to clear the natural vegetation and soil, either within the road reserve, or at designated or instructed areas outside the road reserve, a plan of action shall first be submitted to the Engineer for his approval. Working areas shall be clearly defined and demarcated on site to minimise the construction footprint. 'No-go- areas' and other sensitive areas shall also be clearly demarcated on site, and staff must be made aware of them.

The plan of action shall contain a photographic record and chainage/land reference of the areas to be disturbed. This shall be submitted to the engineer for his records before any disturbance/stockpiling may occur. The record shall be comprehensive and clear, allowing for easy identification during inspections.

(f) Soil management

i) Topsoil

Topsoil shall be removed from all areas where physical disturbance of the surface will occur and shall be stored and adequately protected. The contract will provide for the stripping and stockpiling of topsoil from the site for later re-use. Topsoil is considered to be the natural soil covering, including all the vegetation and organic matter. Depth may vary at each site. The areas to be cleared of topsoil shall include all storage areas. All topsoil stockpiles and windrows shall be maintained throughout the contract period in a weed-free condition. Weeds appearing on the stockpiled or windrowed topsoil shall be removed by hand. Soils contaminated by hazardous substances shall be disposed of at an approved waste disposal site. The topsoil stockpiles shall be stored, shaped and sited in such a way that they do not interfere with the flow of water to cause damming or erosion, or itself be eroded by the action of water.

The Contractor shall ensure that no topsoil is lost due to erosion – either by wind or water. Areas to be top-soiled and grassed shall be done so systematically to allow for quick cover and reduction in the chance of heavy topsoil losses due to unusual weather patterns. The Contractor's programme shall clearly show the proposed rate of progress of the application of topsoil and grassing. The Contractor shall be held responsible for the replacement, at his own

cost, for any unnecessary loss of topsoil due to his failure to work according to the progress plan approved by the Engineer. The Contractor's responsibility shall also extend to the clearing of drainage or water systems within and beyond the boundaries of the road reserve that may have been affected by such negligence.

ii) Subsoil

The subsoil is the layer of soil immediately beneath the topsoil. It shall be removed, to a depth instructed by the engineer, and if not used for road building it shall be stored and maintained separately from the topsoil so that neither stockpile is contaminated by the other. This soil shall be used for rehabilitation purposes by first spreading it over the excavated slopes without interfering with or contaminating the stockpiled topsoil.

Whilst in stockpile it shall be maintained free from erosion and weed infestation in the same way as for topsoil stockpile maintenance.

g) Earthworks and layerworks

This section includes all construction activities that involve the mining of all materials, and their subsequent placement, stockpile, spoil, treatment or batching, for use in the permanent works, or temporary works in the case of deviations. Before any stripping prior to the commencement of construction, the Contractor shall have complied with the requirements of this EMPI. In addition, the Contractor shall take cognisance of the requirements set out below.

i) Quarries and borrow pits

The Contractor's attention is drawn to the requirement of the Department of Mineral Resources, that before entry into any quarry or borrow pit, an Environmental Authorisation for the establishment, operation and closure of the quarry or borrow pit shall have been approved by the Department. It is the responsibility of the Contractor to ensure that he is in possession of the authorisation prior to entry into the quarry or borrow pit. The conditions imposed by the relevant authorisation are legally binding on the Contractor and may be more extensive and explicit than the requirements of this specification. In the event of any conflict occurring between the requirements of the specific authorisation and this EMPI the former shall apply.

ii) Excavation, hauling and placement

The Contractor shall provide the ECO and the Engineer with detailed plans of his intended construction processes prior to starting any cut or fill or layer. The plans shall detail measures by which the impacts of pollution (noise, dust, litter, fuel, oil and sewage), erosion, vegetation destruction and deformation of landscape will be prevented, contained and rehabilitated. Particular attention shall also be given to the impact that such activities will have on the adjacent built environment. The Contractor shall demonstrate his "good housekeeping", particularly with respect to closure at the end of every day so that the site is left in a safe condition.

iii) Spoil sites

The Contractor shall be responsible for the safe siting, operation, maintenance and closure of any spoil site he uses during the contract period, including the defects notification period. This shall include existing spoil sites that are being re-entered. Before spoil sites may be used proposals for their locality, intended method of operation, maintenance and rehabilitation shall be given to the ECO for his/her comments and to the Engineer for his approval. The location of these spoil sites shall have signed approval from the affected landowner before submission to the ECO and the Engineer. No spoil site shall be located within 500m of any watercourse. A photographic record shall be kept of all spoil sites for monitoring purposes. This includes before the site is used and after re-vegetation.

The use of approved spoil sites for the disposal of any waste shall be prohibited.

Spoil sites will be shaped to fit the natural topography. Depending on availability, these sites shall receive a minimum of 75mm topsoil and be grassed with the recommended seed mixture, or a seed mixture approved by the ECO and engineer. Appropriate grassing measures to minimise soil erosion shall be undertaken by the Contractor. This may include both strip and full sodding. The Contractor may motivate to the Engineer for other acceptable stabilising methods. The engineer may only approve a completed spoil site at the end of the defects notification period upon receipt from the Contractor of a landowner's clearance notice.

iv) Stockpiles

The contractor shall plan his activities so that materials excavated from borrow pits and cuttings, in so far as possible, can be transported direct to and placed at the point where it is to be used. However, should temporary stockpiling become necessary, the areas for the stockpiling of excavated and imported material shall be indicated and demarcated on the site plan submitted in writing to the Engineer for his approval, together with the contractor's proposed measures for prevention of environmental damage, containment and subsequent rehabilitation.

The areas chosen shall have no naturally occurring indigenous trees and shrubs present that may be damaged during operations. Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. During the life of the stockpiles the Contractor shall at all times ensure that they are positioned and sloped to create the least visual impact, constructed and maintained so as to avoid erosion of the material and contamination of surrounding environment and kept free from all alien/undesirable vegetation.

After the stockpiled material has been removed, the site shall be re-instated to its original condition. No foreign material generated / deposited during construction shall remain on site. Areas affected by stockpiling shall be landscaped, top-soiled, grassed and maintained at the Contractor's cost until clearance from the Engineer and land owner is received.

Material milled from the existing road surface that is temporarily stockpiled in areas approved by the Engineer within the road reserve, shall be subject to the same condition as other stockpiled materials. Excess materials from windrows, in situ milling or any leftover material from road construction activities may not be swept off the road and left unless specifically instructed to do so in the contract documentation or under instruction from the Engineer.

The ECO shall comment on and the engineer shall approve the areas for stockpiling and disposal of construction rubble before any operation commences and shall approve their closure only when they have been satisfactorily rehabilitated.

v) Blasting activities

Wherever blasting activity is required on the site (including quarries and/or borrow pits) the Contractor shall rigorously adhere to the relevant statutes and regulations that control the use of explosives.

(h) On site plant

i) Crusher, screening plants and concrete batching plants

Crushing plants and concrete batching plants, whether sited inside or outside of defined quarry or borrow pit areas, shall be subject to the requirements of the applicable industrial legislation that governs gas and dust emissions into the atmosphere. Such sites will be the subject of regular inspections by the relative authorities during the life of the project. In addition, the selection, entry onto, operation, maintenance, closure and rehabilitation of such sites shall be the same as for those under section C1007(g)(i) of this EMPI, with the exception that the Contractor shall provide additional measures to prevent, contain and rehabilitate against environmental damage from toxic/hazardous substances. In this regard the Contractor shall provide plans that take into account such additional measures as concrete floors, bunded

storage facilities, linings to drainage channels and settlement dams. Ultimate approval of these measures shall be from the relevant authority, as shall approval of closure. The Engineer will assist the Contractor in his applications to the relevant authority.

Screening activities shall be undertaken so that dust and noise is minimised. This can be done by carefully choosing the site for the activity, and by using slightly damp material.

Effluent from concrete batch plants and crusher plants shall be reused where possible or treated in a suitable designated sedimentation dam to the legally required standards to prevent surface and groundwater pollution. The designs of such a facility should be submitted to the engineer for approval.

ii) **Asphalt Plant**

Asphalt plants shall be subject to the applicable legislation that governs establishment and operation of asphalt plants.

Where a permanent asphalt plant is used, the necessary license is to be in place for the plant and the conditions of such a license will be complied with.

Where a temporary asphalt plant is used, the Contractor shall ensure that the plant is compliant with the prescribed air emission standards for temporary asphalt plants as well as the prescribed emission measurement requirements and reporting requirements.

Operation of the plant shall conform to the same requirements as for a crushing plant or concrete batching plant under C1007 (h) (i) above.

C1008 AREAS OF SPECIFIC IMPORTANCE

Any area, as determined and identified within the project documents as sensitive or of special interest within the site shall be treated according to the express instructions contained in these specifications or the specific environmental authorisation as well as the approved EMPr. The Contractor may offer alternative solutions to the Engineer in writing should he consider that construction will be affected in any way by the hindrance of the designated sensitive area or feature. However, the overriding principle is that such defined areas requiring protection should not be changed. Every effort to identify such areas within the site will have been made prior to the project going out to tender. The discovery of other sites with archaeological or historical interest that have not been identified shall receive ad hoc treatment.

(a) Archaeological Sites

An archaeological screening study of the road reserve did not find any items of significance within the road reserve (refer Basic Assessment Report). No sensitive archaeological sites have thus been identified.

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the engineer of such discovery. The South African Heritage Resource Agency (SAHRA) is to be contacted, and a SAHRA-registered archaeological consultant may undertake the necessary work involved in confirming the find and advising on how it should be preserved or removed. Work may only resume once clearance is given in writing by the archaeologist. (Read with FIDIC condition of contract clause 4.24 as).

If a grave or midden is uncovered on site, or, then all work in the immediate vicinity of the graves/middens shall be stopped and the engineer informed of the discovery. The South African Heritage Resource Agency and the South African Police Services (SAPS) should be contacted and in

the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The undertaker will, together with SAHRA, be responsible for attempts to contact family of the deceased and for the place where the exhumed remains can be re-interred.

(b) Ecological Sensitive Sites

i) Sensitive Species

A number of protected plant species have been identified along Section 5 of the R67 during the ecological assessment that was undertaken for the project and are listed in the Basic Assessment Report (refer Basic Assessment Report). A permit is required before protected plants can be destroyed or relocated.

A number of snakes, including Puff Adder and Rinkhals were observed during the Basic Assessment site visits and ecological study. It is expected that snakes would be encountered during work on site. The ecological specialist recommended that a search and recue process for snakes be implemented. As snakes are found, these must be collected and relocated within 2 km of the point they were collected. This process must be undertaken by an appropriately trained person. A permit is required before the search and rescue process for snakes is undertaken.

ii) Critical Biodiversity Areas

Most of the areas along Section 5 of the R67 are classified as Category 2 Critical Biodiversity Areas (CBA 2) with small areas being classified as Category 1 Critical Biodiversity Areas (CBA 1) (refer Basic Assessment Report). Refer to Section C1012 for special measures that apply to the Critical Biodiversity Areas.

iii) Watercourses (including Wetlands)

Section 5 of the R67 crosses a number of perennial and non-perennial watercourses and drainage lines.

The National Wetland Inventory indicates several wetlands, but the ecological and wetland assessment undertaken as part of the Basic Assessment, found that these were manmade dams, old borrow pits or cut-off drains from agricultural areas that have concentrated run-off into areas and thus giving the appearance of manmade wetlands. Several others were indicated as wetland seeps, but these were confirmed as moist grassland areas, and not wetlands. Several larger wetlands associated with the river wetlands were confirmed as riparian zones (not wetlands) with high alien tree cover of Poplar trees and Salix species.

C1009 REHABILITATION

The Contractor shall be responsible for the re-establishment of grass within the road reserve boundaries for all areas disturbed during construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for, or from, construction has to be stored temporarily, and designated or instructed areas outside the road reserve. It also includes the area where site offices were erected which may require rehabilitation at the end of the contract. All construction material, including concrete slabs and barbecue (braai) areas shall be removed from the site on completion of the contract unless written approval from the relevant landowner demonstrates it is to be left in place.

Responsibility for re-establishment of vegetation shall extend until expiry of the defects notification period. However, SANRAL reserves the right to continue holding retention monies (or not releasing guarantees in lieu of retention) depending upon the state of cover at the end of the defects notification period. Such extension may continue until closure of the relevant quarry or borrow pit has been secured,

Rehabilitation of affected areas should be undertaken as early as possible when the relevant activities are done in order to reduce further environmental damage. All re-vegetation should be undertaken using indigenous vegetation. The standard of rehabilitation should be to the satisfaction of the Engineer and the relevant authorities. The Department of Minerals Resources will only issue closure certificates for borrow pits and quarries when they are satisfied with the rehabilitation undertaken. It should also be noted that in some cases there is a requirement for a final environmental audit covering the extent of the project.

C1010 MONITORING AND RECORD KEEPING

The Engineer and the DEO will continuously monitor the contractor's adherence to the approved impact prevention procedures and the DEO shall submit regular written reports to the ECO and to the Engineer, at least once a month. The DEO will report the environmental compliance performance of the project at regular site meetings. The Engineer shall issue to the Contractor a notice of non-compliance whenever transgressions are observed. The DEO shall document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the engineer in the monthly report.

Copies of all authorisations shall be kept on site and made available for inspection by visiting officials from SANRAL, relevant authorities or internal/external auditors.

C1011 COMPLIANCE AND PENALTIES

The Contractor shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. This record shall be submitted with the monthly reports and an oral report given at the monthly site meetings.

Any non-compliance with the procedures in this EMPI, environmental authorisations and approved EMPr constitute a breach of the Conditions of Contract.

PART 2: PROJECT SPECIFIC ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

C1012 PROJECT SPECIFIC CONDITIONS

(a) Activities, Aspects and Project Phases to be managed

i) Planning and Design Phase

Not applicable. This is an existing road (planning phase completed)

ii) Pre-Construction Phase

Surveying and test work (completed)

iii) Maintenance and Construction Phase

- Road reserve and cross section
 - Widening of road reserve in places
 - Discussions with landowners
 - Land acquisition where applicable
 - Widening of the existing cross-section in places
 - Replacement / construction of new fencing
 - Construction of new guardrails
 - Replacing of damaged road signs
- Installation of traffic calming measures in Whittlesea (raised pedestrian crossings)
- Work at intersections and accesses
 - Discussions with land owners and local authorities
 - Addition of right-turn lanes at some intersections
 - Safety improvements
 - Relocation of some access roads
 - Possible combination of some access roads
- Work on bridges
 - Improvement and repairs
 - No widening of bridges planned
- Work on major culverts
 - Widening / extension of some of the existing culverts
- Work on minor culverts
 - Widening / extension of some of the existing culverts
 - Construction of new inlet and outlet structures at culverts
 - Cleaning of the inlets and outlets of minor culverts
 - Removal and replacement
 - Construction of additional culverts
- Work on road surface
 - Repair
 - Improvement of the vertical alignment

- Strengthening of the existing pavement layers
- Resurfacing
- Work on road shoulders
 - Adding aggregate material on the road shoulders and the in situ reworking of the existing gravel shoulders
- Ancillary road works
- Stormwater and drainage
 - Clearing and shaping of existing open earth drains
 - Stormwater management and drainage
- Traffic, signage and road markings
 - Accommodation of traffic
 - Accommodation of access to local residences and businesses, including guest houses
 - Accommodation of signage to local businesses, including guest houses
 - Construction of road signage and management of road safety during construction
 - New road markings and road studs
- General road construction work
 - Construction camp establishment
 - Offices, shelters and laboratories
 - Storage of materials and equipment
 - Storage and use of fuels and chemicals
 - Use of machinery and equipment
 - Overhaul
 - Site clearing
 - Vegetation removal
 - Topsoil stripping, stockpiling and replacement
 - Earthworks
 - Sourcing of construction aggregate from commercial borrow pits and quarries
 - Excavation of unsuitable soil material (spoil)
 - Spoil handling and placement
 - Pavement layer work
 - Asphalt works / sealing operations
 - Concrete batching
 - Ablution facilities (construction staff)
 - Sourcing and use of water
 - Potable water use (construction staff)
 - Use of water for construction
 - Washing of equipment
 - Waste generation, storage, recycling and disposal
 - Inert waste
 - General waste
 - Hazardous wastes
 - Ongoing re-vegetation and rehabilitation

iv) Rehabilitation Phase

Re-vegetation and rehabilitation of areas disturbed during construction.

v) Operational Phase

Not applicable (SANRAL current operational management practices for the R67 would apply).

(b) Project Specific Aspects to be managed

SANRAL's standard EMPI, as presented in above in Section C1001 to C1011, represents environmental management measures typical to all road construction projects.

This section of the document contains environmental management measures specific to the Improvement and Resurfacing on National Route R67 Section 5 from Whittlesea (km 0.00) to Queenstown (km 32.92) and thus represents the EMPr for the project.

The following aspects have relevance to the project.

Aspect 1: Designated Environmental Officer (DEO)

Aspect Description: Appointment of an individual responsible to ensure that the provisions of the EMPI and EMPr are complied with during the life of the project.

The environmental sensitivity of the project dictates whether the approved DEO should be able to assume other construction duties, or should be a dedicated officer with no other encumbrances.

- In the case of a construction project in a particularly sensitive environment, a Dedicated Environmental Officer may be required, with no other work responsibilities.
- In the case of maintenance, repair or construction in a less sensitive environment, a Designated Environmental Officer may be required, who may also assume other duties.

Impacts and Risks to be Managed: Unnecessary environmental degradation and/or pollution and due to non-compliance with the EMP as a result of a lack of understanding and/or delegation of responsibilities.

Management Objectives: Clearly defined organisational and administrative arrangements for EMP implementation and monitoring of compliance.

Impact Management Statement: **Actions:** SANRAL Standard EMPI:
As per Section C1004: **Error! Reference source not found.**

Project Specific EMPr:
The specific project requires a Designated Environmental Officer.

The Designated Environmental Officer's duties shall hold primacy over other contractual duties.

The Engineer has the authority to instruct the contractor to reduce the DEO's other duties or to replace the DEO if, in the engineer's opinion, he/she is not fulfilling his/her duties in terms of the requirements of the EMPI and EMPr. Such instruction will be in writing clearly setting out the reasons why a replacement is required.

Time Period: Ongoing.

Project Phases: Construction.
Rehabilitation.

Management Outcomes: Nomination of a designated DEO completed.
Curriculum Vitae approved by Engineer.
The responsibilities of the DEO are understood.
Monthly DEO reports completed and submitted.

Monitoring: Method: Verify appointment and *curriculum vitae* of DEO.

Mechanism: Document review.

Frequency: Whenever there is a change in personnel or a new appointment of a DEO.

Aspect 2: Site establishment and work areas

Aspect Description: The presence of construction camps, offices, laydown of equipment and materials, workshops, staff accommodation and testing facilities on the site in order to facilitate construction. These areas are typically associated with the clearance of an area and vegetation removal, grading, storage and use of hydrocarbons and other chemicals, ablution facilities (sewerage), and the generation of waste.

Impacts and Risks to be Managed: Damage to sensitive vegetation, nuisances to neighbours, and water pollution due to incorrect siting and management of work areas.

Management Objectives: Correct siting and management of work areas.

Impact Management Statement: **Actions:** SANRAL Standard EMPI Management Actions:
C1007(a) Site Establishment
C1007(e) Clearing the Site

Project Specific Management Actions:

Before any site establishment can begin, the Contractor shall submit to the ECO for comments and to the Engineer for approval, site plans of the exact location, extent and detail of his activities. The site plan will address the locality and layout as well as the impact mitigation measures the Contractor proposes to put in place for:

- Construction camps
- Satellite camps
- Site offices
- Workshops
- Staff accommodation
- Testing facilities
- Stockpile areas
- Spoil stockpiles and areas where spoil material will be applied / reused.
- Ablution facilities

- Refuelling areas
- Concrete batching and handling of waste concrete and water containing cement
- Bitumen storage and handling and management of waste bitumen
- Storage of chemicals and hazardous materials and equipment on the site
- Storage of materials and equipment

Preference to be given to flat areas along the route that are as far away as possible to watercourses and sensitive areas. The following will be given due consideration:

- Avoid areas within 500 metres from wetlands unless formal approval is obtained from the DWS.
- Avoid within the 1 in 100 year floodline and riparian zone along watercourses unless formal approval is obtained from the DWS.
- Avoid where possible areas within category 1 Critical Biodiversity Areas (CBA 1).
- Minimise where possible areas within category 2 Critical Biodiversity Areas (CBA 2).
- Avoid damage to or removal of protected species unless the necessary permits are in place.
- Avoid privately owned land unless there is a written agreement in place with the landowner.
- Minimise areas where indigenous trees have to be damaged or chopped down.

Time Period: At start of construction and when new work areas are established.

Project Phases: Construction.

Management Outcomes: Site layout plan approved before establishment of work areas. Impacts on water courses and sensitive areas minimised and avoided where possible.

Monitoring Method: ECO to verify location of work areas.

Mechanism: Verify works areas on site against site establishment plan. Comparison of before and after photographs.

Frequency: At start of construction and before new work areas are developed.

Aspect 3: Spill prevention and management

Aspect Description: Diesel and various chemicals used during road construction and potentially hazardous wastes are produced. This includes: cement, concrete, sewage, chemicals, fuels, oils and lubricants, paints, solvents, aggregate, tailings, wash water, organic materials and bituminous products.

Impacts and Risks to be Managed: Inappropriate storage and handling of hazardous substances could result in the release of hazardous substances into the receiving environment, resulting in air, soil and water pollution and it may affect the health and well-being of people, plants and animals.

Management Objectives: Avoid soil, air and water pollution.
Avoid impacts on the health and well-being of people, plants and animals.

Impact Management Statement: **Actions:** SANRAL Standard EMPI:
C1006(b) Spillages
C1007(d) Control at Workshops
C1009 Rehabilitation

Project Specific EMPr:
DEO to maintain a photographic record of clean-up and remediation activities after a spill, to be submitted to the engineer as part of the DEO's monthly report.

Time Period: Ongoing.

Project Phases: Construction.
Rehabilitation.

Management Outcomes: Correct storage and handling of hazardous substances.
Adequate containment systems area in place.
Early detection of spills or pollution containment system failures.
Adequate rehabilitation measures implemented.

Monitoring Method: In case of a spill, water monitoring as described in Standard EMPI C1006(b) Spillages.

Mechanism: Laboratory results of water samples taken.
Compare sample results with applicable water quality standards.

Frequency: Monthly until water quality criteria outlined in Standard EMPI C1006 (b) Spillages, are being met.

Aspect 4: Souring and abstraction of water

Aspect Description: Due to linear nature of the activity, construction water may have to be obtained from a number of boreholes, streams and dams at location along the route, which may be situated on third party / private land.

National Water Act requirements applicable to sourcing and abstraction of water.

Impacts and Risks to be Managed: Inappropriate or unlawful use of water resources.

Management Objectives: All water uses are lawful.
Correct approvals and agreements with landowners are in place.

Impact Management Statement:	Actions:	<p><u>SANRAL Standard EMPI:</u> C1006 (c) Water Use and Control (Sourcing and Abstraction of Water, and Water Consumption)</p> <p><u>Project Specific EMPr:</u> Where applicable, an agreement with landowners will be put in place before water is drawn from streams, dams, or boreholes and before new boreholes are developed on land owned by third parties.</p>
	Time Period:	Ongoing.
	Project Phases:	Construction. Rehabilitation.
Management Outcomes:		All water uses are lawful. Correct approvals and agreements with landowners are in place.
Monitoring	Method:	ECO EMPr compliance audits.
	Mechanism:	Audit checklist and audit report. Contractor records of water sources used. Verify records of agreements with landowners. Verify records of approvals from DWS where required.
	Frequency:	Monthly.

Aspect 5: Work at watercourses (culverts and bridges)

Aspect Description:	The road crosses a number of rivers and smaller watercourses. Work at culvert and bridges will be undertaken in areas prone to flooding. National Water Act requirements applicable to work undertaken near watercourses, including wetlands.
Impacts and Risks to be Managed:	Erosion and sedimentation of water courses due to the vegetation removal, presence of excavations and loose material in water courses. Inappropriate or unlawful use of water resources.
Management Objectives:	Minimise impacts on water courses. All water uses to the lawful.

Impact Management Statement:	Actions:	<p><u>SANRAL Standard EMPI Management Actions:</u> C1006 (c) Water Use and Control (Work at watercourses (culverts and bridges))</p> <p><u>Project Specific Management Actions:</u> No construction work will be undertaken within 500 metres radius from the boundary of a wetland, within the 1:100 year floodline or within the riparian zone of the watercourse without the necessary written approval from the Department of Water and Sanitation (DWS).</p>
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The Contractor shall ensure that any temporary or permanent alteration to the bed, banks, course or characteristics of watercourses (including wetlands) as well as the temporary permanent diversion or impedance of the flow of water in watercourses (including wetlands), typically associated with the construction of culverts and bridges, are undertaken in such a manner that the risks to the environment are minimised. The following risks will be considered and minimised.

- Erosion; and the presence of unstable structures and stockpiles in areas prone to flooding; and induced flooding.
- Potential, measurable or cumulative detrimental change in the stability of a watercourse; change in the physical structure of a watercourse; scouring, erosion or sedimentation of a watercourse; or decline in the diversity of communities and composition of the natural, endemic vegetation.
- Potential, measurable or cumulative detrimental change in the quantity, velocity, pattern, timing, water level and assurance of flow in a watercourse will be minimised.
- Potential, measurable or cumulative detrimental change in the water quality characteristics of the watercourse.
- Potential, measurable or cumulative detrimental change on the breeding, feeding and movement patterns of aquatic biota, including migratory species; level of composition and diversity of biotopes and communities of animals and microorganisms; or condition of the aquatic biota.
- Potential, measurable or cumulative detrimental impact on the characteristics of a watercourse.
- Detrimental impact on water users and other lawful water uses and land.
- Detrimental impacts to the health and safety of the public.

The Contractor to submit method statements for work to be undertaken within 500 metres radius from the boundary of a wetland, within the 1:100 year floodline or within the riparian zone, to the Engineer for comment.

The method statements to detail how the work will be undertaken, where materials, equipment, aggregate, spoil material and waste will be stored, how stormwater will be managed, how the flow of water in watercourses will be accommodated, what risks to the environment are foreseen and what measures will be employed to minimise such risks.

The method statements to specifically detail how erosion, sedimentation and pollution of watercourses will be prevented, how hazardous liquids used in construction will be contained, and what measures for rehabilitation will be implemented.

Time Period: Ongoing.

Project Phases: Construction.

Management Outcomes: Necessary approvals for work near watercourses are in place. Impacts are minimised.

Monitoring Method: ECO EMPr compliance audits.

Mechanism: Audit checklist and audit report.
Contractor method statements.
Verify records of approvals from DWS, where required.

Frequency: Monthly.

Method: Water monitoring at new bridges and culvert construction sites, as described under EMPI C1006(c) Water Use and Control (Work and Watercourses (Culverts and Bridges)).

Mechanism: Laboratory results of water samples taken.
Comparison of upstream and downstream water quality.

Frequency: Monthly.

Method: DEO inspections.

Mechanism: Inspection checklist, added to report to Engineer.

Frequency: DEO on site daily.
Monthly report.

Aspect 8: Protected Plants

Aspect Description:

The following protected plant species have been observed during the ecological assessment (refer Basic Assessment Report).

<u>Botanical Name</u>	<u>Family</u>	<u>Regional Distribution/Endemism</u>	<u>Distribution within the site</u>
<i>Aloe species (excluding ferox)</i>	Asphodelaceae	EC endemic, widespread	Widespread, within the area.
<i>Crassula sp</i>	Crassulaceae	EC, WC, KZN	Isolated specimens usually associated with rocky cliffs.
<i>Ericas spp</i>	Ericaceae	EC / WC	Isolated specimens in the montane grassland areas.
<i>Kniphofia spp</i>	Asphodelaceae	Widespread	Found in isolated areas associated within the larger drainage lines and watercourses.

Impacts and Risks to be Managed:	Unnecessary environmental degradation and eradication of protected plant species along the route, due to non-compliance with the EMP as a result of a lack of understanding and/or delegation of responsibilities.
Management Objectives:	Permit to be in place before removal of protected plants.
Impact Management Statement:	<p>Actions:</p> <p><u>SANRAL Standard EMPI:</u> C1006(d) Vegetation Management C1007(a)(ii)Vegetation C1008(a) Ecological Sensitive Sites</p> <p><u>Project Specific EMPr:</u> Contractor to verify that a permit is place before protected plants are relocated or destroyed. DEO to undertake search and rescue in accordance with permit requirements. ECO to develop a method statement for relocation and protection of plants based on the outcome of the search and rescue.</p>
Time Period:	Before construction in an area.
Project Phases:	Construction.
Management Outcomes:	Permit to be in place before removal of protected plants. Protected plants to be relocated in accordance with permits.
Monitoring Method:	DEO to record accurately the removal of protected plants by taking a photograph. ECO compliance audits.
Mechanism:	Inspection checklist, added to report to Engineer. Visual inspection of site. Verify that before and after photographs are taken.
Frequency:	Monthly.

Aspect 9: Sensitive Fauna Species

Aspect Description:	A number of snakes, Puff Adder and Rinkhals were observed during the Basic Assessment site visits and ecological study.
Impacts and Risks to be Managed:	Killing of snakes encountered during work on site. Dangers to workforce if snakes are encountered on site.
Management Objectives:	Permit in place for search and rescue of snakes. Snakes to be safely removed from site and relocated according to permit conditions.
Impact Management Statement:	<p>Actions:</p> <p><u>SANRAL Standard EMPI:</u> C1008(a) Ecological Sensitive Sites</p> <p><u>Project Specific EMPr:</u> Undertake a search and rescue process for snakes.</p>

A permit is required before the search and rescue process for snakes is undertaken.

Snakes found must be collected and relocated as per the stipulations of the permit; generally this is within 2 km from where it was found.

Handing of snakes to be undertaken by an appropriately trained person.

Time Period: Ongoing.

Project Phases: Construction.

Management Outcomes: Permit to be in place before removal of snakes.
Snakes to be relocated in accordance with permits.

Monitoring Method: ECO compliance audits.

Mechanism: Inspection checklist, added to report to Engineer.
Record of all snakes found on site.
Register signed by snake handler when snakes are relocated.
Verify that before and after photographs are taken where possible.

Frequency: Monthly.

Aspect 10: Alien Species

Aspect Description: The following alien plant species have been observed during the ecological assessment (refer Basic Assessment Report).

<u>Declared alien / weed plants along / proximate to the road reserve</u>	<u>Legislation and required actions</u>
<i>Acacia mearnsii</i>	Category 2 CARA, which may be propagated in controlled conditions, but may not be traded
<i>Cerues jamacara</i>	Category 1 CARA, which must be destroyed
<i>Eucalyptus grandis</i>	Category 2 CARA, must be controlled
<i>Opuntia ficus indica</i>	Category 1 CARA, which must be destroyed
<i>Solanum mauritianum</i>	Category 1 CARA, which must be destroyed
<i>Pinus spp</i>	Category 2 CARA, must be controlled

Impacts and Risks to be Managed: Occurrence of alien Acacias Opuntia species
Prevent spread of other alien plants as listed above

Management Objectives: Prevent spread of alien vegetation
Re-vegetate area where possible

Impact Management Statement: **Actions:** SANRAL Standard EMPI:
C1006(d) Vegetation Management
C1007(a)(ii)Vegetation

Project Specific EMPr:
None required.

Time Period: Ongoing.

Project Phases: Construction.

Management Outcomes: Reduce invasion of alien vegetation

Monitoring Method: ECO compliance audits.

Mechanism: Inspection checklist, added to report to Engineer.
Visual inspection of site.
Continuous monitoring of alien vegetation.
Verify that before and after photographs are taken.

Frequency: Monthly.

Aspect 11: Accommodation of Traffic and Signage

Aspect Description: Guest houses and guest farms along Section 5 of the R67 is
reliant upon easy access to their facilities
Factories and farms require access to the R67 or an alternative
route

Impacts and Risks to be Managed: Guest houses have fewer guests due to lack of access and
signage
Road users experience delays and have to travel further
Increased safety risk to road users

Management Objectives: Keep affected parties content with the improvements to the R67
Appropriate and adequate signage for information for road users
and guest house / business clientele

Impact Management Statement: **Actions:** SANRAL Standard EMPI:
C1006(e) Dust Control
C1006(f) Noise Control
C1006(g) Energy Consumption
C1007(g) Earthworks and Layerworks

Project Specific EMPr:
Contractor to ensure that appropriate signage is in place
indicating guest house locations
Contractor to ensure adequate access to business and guest
house premises at all times
Advance notice regarding changes to traffic management

Time Period: Ongoing.

Project Phases: Construction.

Management Outcomes: Minimum economic impact on affected businesses including Guest Houses

Monitoring Method: ECO compliance audits.

Mechanism: Inspection checklist, added to report to Engineer.
Visual inspection of site.
Verify that before and after photographs are taken.

Frequency: Monthly.

Aspect 12: Land Acquisition and Road Reserve

Aspect Description: Acquire land from local, regional, district authorities and farmers for widening of road reserve.

Impacts and Risks to be Managed: Parties unwilling to
Negative impact on local communities
Negative impact on land owners

Management Objectives: Keep acquisition process transparent
Negotiate on an equitable basis with all affected parties

Impact Management Statement: **Actions:**
Project Specific EMPr:
SANRAL and Engineer to contact all affected parties and complete negotiations prior to physical change in road reserve.
Contractor not to enter private property or remove/erect fencing on private property without landowner consent
Adhere to Aspects 2 – 10 above in respect of widened road reserve.

Time Period: Ongoing.

Project Phases: Construction.

Management Outcomes: Widening of road reserve in accordance with engineering specifications

Monitoring Method: ECO compliance audits.

Mechanism: Inspection checklist, added to report to Engineer.
Visual inspection of site.
Verify that before and after photographs are taken.

Frequency: Monthly.

Aspect 13: Managing Concerns and Requests Raised by IAPs

Aspect Description: IAPs must have a vehicle to register issues and complaints iro the Improvement and Resurfacing on National Route R67 Section 5 from Whittlesea (km 0.00) to Queenstown (km 32.92). Investigate need for cattle creeps and water pipe sleeves across the road

Impacts and Risks to be Managed: IAPs take legal action against SANRAL Negative publicity iro the Improvement and Resurfacing on National Route R67 Section 5 from Whittlesea (km 0.00) to Queenstown (km 32.92).

Management Objectives: Deal effectively with IAP concerns

Impact Management Statement: **Actions:**
Project Specific EMPr:
Contractor to establish an IAP issues and responses register
Contractor to provide email address for IAPs to lodge issues iro project
DEO contact number to be provided to IAPs
All project specific issues to be submitted in writing to Contractor by IAPs
DEO/Engineer to respond to IAP queries in less than 30 days

Time Period: Ongoing.

Project Phases: Construction.

Management Outcomes: Resolve IAP queries and issues timeously

Monitoring Method: ECO compliance audits.

Mechanism: Query register
Query checklist, added to report to Engineer.

Frequency: Monthly.