**Section D: Impact Assessment**

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. **Impacts that may result fRom the planning and design, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE phaseS AS WELL AS PROPOSED MANAGEMENT OF identified IMPACTS AND PROPOSED mitigation measures**

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

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| * 1. **Project Description**   The Ulundi Municipality electrical infrastructure is ageing, with no master plan nor sufficient funds to develop, maintain and operate the network. Eskom relies on the municipality’s flexibility and schedule in attending to faults. The Ulundi municipality network has got no back-feed capability, hence Eskom’s supply is interrupted whenever the municipality’s network experiences faults. This has affected all Eskom’s customers supplied off the wheeled network, including Ulundi NB59 and Ulundi NB35. The confirmed developments around Ulundi area require a new source of supply. It is prudent to establish a reliability substation in the vicinity of Mahlabatini in order to cater for the anticipated load, while ensuring compliance with the reliability gate keepers. The new substation will have feeders interconnection with Nyokeni, Hlabisa and Mtonjaneni substation. The study area is located just north east of the township of Mahlabatini which is in turn located north of Ulundi.  Sineke Developments was appointed by Eskom to conduct the environmental impact assessment process.  Eskom proposes to:   * Establish 2\*88kV feeder bays and equip them accordingly. * Establish 88/22kV 2\*20MVA transformer with associated equipment. * Establish 8\*22kV feeder ( leave only 2 Feeder bays unequiped); * Construct an approximately 1.4 km each loop-in loop-out line from the Ncwane/Okuku 88kV line in Chickadee conductor to supply Njonjo Substation, which will be located in the close vicinity of the line. * Equip the following feeder bays and construct MV feeders as follows: Feeder 1 to supply Ulundi NB59, approximately 4km to tie in at T2095L5; Feeder 2 to supply Ulundi NB35, approximately 3km to tie in at T2329L3; All the TIL's will be constructed using the Hare conductor.   **Approach**  The approach to this is twofold in order to simplify decision making regarding the selection of a suitable Substation site and an associated Turn In Line (TIL) corridor. To this end the four alternative Substation Sites were initially identified, however Alternative Site 1 was subsequently discarded (Map 2 in Appendix A). Hence only three will be assessed based on the criteria below and a preferred site will be identified.  The second step in the assessment process is to identify alternative TIL corridors. Two Alternative TIL corridors were identified (Map 2 in Appendix A). Corridors of 400 m were assessed for the identified TIL corridors.  **Methodology**  This section provides a description of the potential positive and negative biophysical and socio-economic impacts associated with planning and design, construction, operation, decommissioning and closure of the proposed project. The methodology used to assess the impacts related to the proposed project is outlined below:   * The **nature**, a description of what causes the effect, what will be affected and how it will be affected; * The **extent**, which indicates the extent scale of the impact;   + **Individual (0)** – this scale applies to person/s in the area;   + **Household (1)** – this scale applies to households in the area;   + **Local (2)** – small scale impacts from a few hectares in significance e.g. local district area;   + **Regional (3)** – the scale applies to impacts on a provincial level;   + **National (4)** – the scale applies to impacts that will affect the whole South Africa; and   + **International (5)** – the scale of the impact will extend beyond the borders of South Africa. * The **duration**, which indicates the time scale of the impact;   + **Short Term (1)** – less than 5 years;   + **Medium Term (2)** – between 5 and 15 years;   + **Long Term (3)** – between 15 and 30 years;   + **Permanent (4)** – over 30 years and resulting in a permanent and lasting change that will always be there. * The **intensity**:   + **Very High (4)** – The impacts would be considered by society as constituting a major and usually permanent change to the environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects.   + **High (3)** – These impacts will usually result in long term effects on social and/or natural environment. Impacts rated as **High** will need to be considered by society as constituting an important and usually long term change to the environment. Society would probably view these impacts in a serious light.   + **Moderate (2)** – These impacts will usually result in medium-term to long-term effects on the social and/or natural environment. Impacts rated as Moderate will need to be considered by society as constituting a fairly important and usually medium term change to the environment. These impacts are real but not substantial.   + **Low (1)** – These impacts will usually result in medium to short term effects on the social and/or natural environment. These impacts are not substantial and are likely to have little real effect.   + **Non Significant (0)** – There are no primary or secondary effects at all that are important to scientists or the public. * The **probability** of occurrence, which describes the likelihood of the impact occurring.   + **Very unlikely to occur (1)** – the chance of these impacts occurring is extremely slim.   + **Unlikely to occur (2)** – the risk of these impacts occurring is slight.   + **May occur (3)** – the risk of these impacts is more likely, although not definite.   + **Will definitely occur (4)** – this impact will occur. * The **degree of confidence or certainty**   The degree of confidence or certainty indicates the degree of certainty or confidence with which one has predicted the Significance of an impact.   * + **Definite.** More than 90% sure of a particular fact. To use this one, will need to have substantial supportive data.   + **Probable.** Over 70% sure of a particular fact, or of the likelihood of that impact occurring.   + **Possible.** Only over 40% sure of a particular fact, or of the likelihood of an impact occurring.   + **Unsure.** Less than 40% sure of a particular fact or the likelihood of an impact occurring. * The s**ignificance,** is a synthesis of characteristics described above and can be assessed as low, medium or high. * The **status**, which is described as either positive, negative or neutral. * The degree to which the impact can be reversed. * The degree to which the impact may cause irreplaceable loss of resources. * The degree to which impact can be mitigated.   The significance is determined by combining the criteria in the following formula:  S=(E+D+I)P; where  S= significance rating  E= Extent  D= Duration  I= Intensity  P= Probability  The significance ratings for each potential impact are as follows:   * ≤19 points: **Low** (i.e. where this impact would not have a direct influence on the decision to develop in the area); * 20-34 points: **Medium** (i.e. where this impact could influence the decision to develop in the area unless it is effectively mitigated) * ≥35 points: **High** (i.e. where the impact must have an influence on the decision process to develop in the area). |

Four alternative substation sites were identified and Alternative Site 1 was subsequently was discarded. Alternative Site 1 was discarded as it would not be technically feasible to construct all MV Lines from Alternative Site 1 since the south eastern side of the adjacent surrounding environment is built up. There is a mission high school adjacent to the south eastern side of Alternative Site 1. The impacts of developing on the remaining sites (sites 2, 3 and 4) and the two alternative TIL corridors have been described for the various phases of the proposed development namely planning and design phase, construction phase, operation phase and, decommissioning and closure phase in the tables below. The nature of each impact is described. The significance of each impact before mitigation was assessed in terms of its duration, extent, intensity, probability of occurrence, status, reversibility, irreplaceability loss of resources, and whether or not the impact can be mitigated. The significance rating was calculated as indicated above. The significance of each impact after mitigation was also assessed as above and significance rating was calculated as above. Mitigation for each impact has also been suggested. Impacts have been categorised into direct, indirect and cumulative impacts.

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| **PLANNING AND DESIGN PHASE** |

**TABLE 1: SUBSTATION ALTERNATIVE SITE 2: PLANNING AND DESIGN PHASE**

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| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Flora:**  * Survey requires;   + Pegging of sites that need to be visible so some amount of vegetation would have to be removed/cleared.   + Movement of vehicles during survey could impact vegetation. * Geotechnical investigations will involve the use of heavy machinery;   + Moving machinery impacts vegetation.   + Test pits also impact on vegetation.   + Stock piles impact on vegetation.   + Topsoil may be lost through erosion. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 20 | * A walk about during surveys must be considered than using vehicles to access the area. * Existing access routes must be used. * Movement and turning of heavy equipment should be restricted to the roads and less sensitive areas. * Test pits should be backfilled immediately after assessment. * In backfilling surrounding vegetation should not be destroyed. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Access Roads:**  * New access roads may impact on areas of high sensitivity (natural vegetation, protected tree species, etc). * Upgrading of existing roads may impact on sensitive environments. * Access roads exist and will need to be extended by a few meters so only moderate impact will be created by the proposed development. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Medium (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Access roads must be designed prior to construction commencing to ensure that the most preferable access route to the substation has been identified. * Use should be made of existing roads as far as possible. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| **INDIRECT IMPACTS** | | | |
| 1. **Ecological:**  * In the event of soil being washed away from test pits it could impact on the nearby stream. * Disturbance of vegetation and geotechnical investigation sites could trigger invasion of alien plants and spread of these into sensitive ecological areas. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Backfilling should be done as soon as possible. * Minimise disturbance to vegetation in the area and impact on or pollute the nearby stream. * There should be long-term monitoring of alien plants around the substation site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Social:**  * Movement of strangers and machinery may disrupt the social activities of community members. * Community may be exposed to safety risks from the movement of machinery. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **CUMULATIVE** | | | |
| 1. **Ecological and Social impacts**  * There are ecological and social impacts that if not planned for could result in higher impacts than if the development were not implemented. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * The mitigation measures indicated above should be considered during planning. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |

**TABLE 2: SUBSTATION ALTERNATIVE SITE 3: PLANNING AND DESIGN PHASE**

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| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Flora:**  * Survey requires;   + Pegging of sites that need to be visible so some amount of vegetation would have to be removed/cleared.   + Movement of vehicles during survey could impact vegetation. * Geotechnical investigations will involve the use of heavy machinery;   + Moving machinery impacts vegetation.   + Test pits also impact on vegetation.   + Stock piles impact on vegetation.   + Topsoil may be lost through erosion. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 20 | * A walk about during surveys must be considered than using vehicles to access the area. * Existing access routes must be used. * Movement and turning of heavy equipment should be restricted to the roads and less sensitive areas. * Test pits should be backfilled immediately after assessment. * In backfilling surrounding vegetation should not be destroyed. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Access Roads:**  * New access roads may impact on areas of high sensitivity (natural vegetation, protected tree species, etc). * Upgrading of existing roads may impact on sensitive environments. * Access roads exist and will need to be extended by a few meters so only moderate impact will be created by the proposed development. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Medium (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Access roads must be designed prior to construction commencing to ensure that the most preferable access route to the substation has been identified. * Use should be made of existing roads as far as possible. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| **INDIRECT IMPACTS** | | | |
| 1. **Ecological:**  * In the event of soil being washed away from test pits it could impact on the nearby stream. * Disturbance of vegetation and geotechnical investigation sites could trigger invasion of alien plants and spread of these into sensitive ecological areas. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Backfilling should be done as soon as possible. * Minimise disturbance to vegetation in the area and impact on or pollute the nearby stream. * There should be long-term monitoring of alien plants around the substation site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Social:**  * Movement of strangers and machinery may disrupt the social activities of community members. * Community may be exposed to safety risks from the movement of machinery. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **CUMULATIVE** | | | |
| 1. **Ecological and Social impacts**  * There are ecological and social impacts that if not planned for could result in higher impacts than if the development were not implemented. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * The mitigation measures indicated above should be considered during planning. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |

**TABLE 3: SUBSTATION ALTERNATIVE SITE 4 (PREFERRED SITE): PLANNING AND DESIGN PHASE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Flora:**  * Survey requires;   + Pegging of sites that need to be visible so some amount of vegetation would have to be removed/cleared.   + Movement of vehicles during survey could impact vegetation. * Geotechnical investigations will involve the use of heavy machinery;   + Moving machinery impacts vegetation.   + Test pits also impact on vegetation.   + Stock piles impact on vegetation.   + Topsoil may be lost through erosion. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 20 | * A walk about during surveys must be considered than using vehicles to access the area. * Existing access routes must be used. * Movement and turning of heavy equipment should be restricted to the roads and less sensitive areas. * Test pits should be backfilled immediately after assessment. * In backfilling surrounding vegetation should not be destroyed. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Access Roads:**  * New access roads may impact on areas of high sensitivity (natural vegetation, protected tree species, etc). * Upgrading of existing roads may impact on sensitive environments. * Access roads exist and will need to be extended by a few meters so only moderate impact will be created by the proposed development. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Medium (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Access roads must be designed prior to construction commencing to ensure that the most preferable access route to the substation has been identified. * Use should be made of existing roads as far as possible. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| **INDIRECT IMPACTS** | | | |
| 1. **Ecological:**  * In the event of soil being washed away from test pits it could impact on the nearby stream. * Disturbance of vegetation and geotechnical investigation sites could trigger invasion of alien plants and spread of these into sensitive ecological areas. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Backfilling should be done as soon as possible. * Minimise disturbance to vegetation in the area and impact on or pollute the nearby stream. * There should be long-term monitoring of alien plants around the substation site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Social:**  * Movement of strangers and machinery may disrupt the social activities of community members. * Community may be exposed to safety risks from the movement of machinery. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **CUMULATIVE** | | | |
| 1. **Ecological and Social impacts**  * There are ecological and social impacts that if not planned for could result in higher impacts than if the development were not implemented. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * The mitigation measures indicated above should be considered during planning. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |

**TABLE 4: SUMMARY OF IMPACTS AND SIGNIFICANCE RATINGS DURING PLANNING AND DESIGN.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Alternative Substation Site 2** | | | | **Alternative Substation Site 3** | | | | **Alternative Substation Site 4 (Preferred Site)** | | | |
| **IMPACTS** | **Without mitigation** | | **With mitigation** | | **Without mitigation** | | **With mitigation** | | **Without mitigation** | | **With mitigation** | |
| DIRECT |  |  |  |  |  |  |  |  |  |  |  |  |
| Flora | Med | -20 | Low | -8 | Med | -20 | Low | -8 | Med | -20 | Low | -8 |
| Access roads | Med | -24 | Low | -12 | Med | -24 | Low | -12 | Med | -24 | Low | -12 |
| **Total** |  | **-44** |  | **-20** |  | **-44** |  | **-20** |  | **-44** |  | **-20** |
| INDIRECT |  |  |  |  |  |  |  |  |  |  |  |  |
| Ecological | Low | -18 | Low | -8 | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| Social | Low | -15 | Low | -8 | Low | -15 | Low | -8 | Low | -15 | Low | -8 |
| **Total** |  | **-33** |  | **-16** |  | **-33** |  | **-16** |  | **-33** |  | **-16** |
| CUMULATIVE |  |  |  |  |  |  |  |  |  |  |  |  |
| Ecological and Social | Low | -18 | Low | -8 | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| **GRAND TOTAL** |  | **-95** |  | **-44** |  | **-95** |  | **-44** |  | **-95** |  | **-44** |

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| **CONSTRUCTION PHASE** |

**TABLE 5: SUBSTATION ALTERNATIVE SITE 2: CONSTRUCTION PHASE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Topography and Soils:**  * Stripping of soil may lead to soil erosion at the substation site. * Erosion may occur where top soil stockpiles are incorrectly managed. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 | * Disturbed areas of natural vegetation as well as cut and fill areas must be rehabilitated immediately after construction to prevent soil erosion. * Limit construction, maintenance and inspection activities to dry periods in order to curb occurrence or worsening of erosion in areas of existing erosion. * Soil erosion control measures shall be implemented. * The Contractor should provide a method statement on erosion control showing clearly how cleared surfaces and storm water will be managed on site during construction and rehabilitation of the site. * Remove and store topsoil separately in areas where excavation takes place. Topsoil should be used for rehabilitation purposes in order to facilitate re-growth of species that occur naturally in the area. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Ablution Facilities:**  * Pollution of ground water and surface water resources as a result of failure to supply clean ablution facilities. | **Duration:** Short-term (1)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 28 | * Adequate chemical toilets should be provided at camp site and on the work front. * Secured chemical toilets will be serviced weekly in accordance with appropriate health and safety standards. * No human waste will be allowed to enter water courses or natural drainage lines. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Spillage of hazardous chemicals:**  * Spillage of stored hazardous substances such as diesel can contaminate ground and surface water. | **Duration:** Short-term (1)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * Use and/or storage materials, fuels and chemicals which could potentially leak into the ground must be controlled. * Adequate spill kits and containers for spilled contaminated material to be on standby on site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Flora:**   **Vegetation clearing at substation site:**  Impacts may include:   * Increased runoff will cause soil and water loss. * Removal of indigenous, protected or endangered species. * Incorrect disposal of alien vegetation leading to rapid re-establishment. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** Very High (4)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 36 | * Vegetation may only be cleared within demarcated work area. * There should be no unnecessary removal of vegetation/plants which would leave soil exposed over a long period of time. * Alien invasive plant species are to be removed from any area within the construction area and be disposed of at a licensed landfill site. * The area should be re-vegetated upon completion of construction activities. * Cutting of trees for the purposes of pegging, firewood and any other activity should not occur. * Parking and turning of machinery should be at designated sites.. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 |
| 1. **Heritage:**  * Heritage studies conducted did not unearth any material of heritage significance at the site. However, materials may be subsurface which will only be discovered during earthworks. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 | * If any material is suspected to be of cultural or heritage significance, work at the site should be stopped and the occurrence should immediately be reported to AMAFA on 0333946543. The archaeologist should then investigate and evaluate the find. * NHRA requires that a developer cease all work immediately and adhere to the protocol described in section 9 of the HIA report (attached) should any heritage resources, as defined in the Act, be discovered during the course of development activities. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Waste:**  * Waste generation during construction phase will have a negative impact on the environment, if not controlled adequately. Waste includes general waste, construction rubble, hazardous waste (used oil, cement and concrete etc.). | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 | * Waste bins with lids will be provided on site for all waste pertaining to food and drinks. These shall be supplied in close proximity to the area where workers eat. * The site is to be checked for litter daily. All litter should be collected and deposited in waste bins. * Where possible, construction waste on site must be reused or recycled. * Disposal of waste must be in accordance with relevant legislative requirements. * Hazardous waste will be kept in correctly sealed storage bins in a shaded and bunded area. * The Contractors must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation. * Burning of waste material will not be permitted. * Further detailed mitigation measures are included in the EMP (Appendix G). | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Dust:**  * Generation of dust resulting in reduction in air quality. The following possible sources of fugitive dust have been identified as activities which could potentially generate dust during construction at the site: vehicle activities associated with the transport of equipment to the site; preparation of surface areas which may be required prior to the set up of new infrastructure; and the removal of construction equipment from site after the set up of new equipment. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 20 | * Frequent and effective dust suppression is advised, particularly along dirt roads. Dust must be suppressed on the construction site during dry periods by the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of runoff. * Stockpiles are to be covered with high density shade cloth or other similar material, appropriately pegged down, to assist in suppressing dust. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Noise:**  * During the construction phase there is likely to be an increase in noise pollution beyond the allowable residential threshold of 70 db. The following possible sources of noise could potentially generate noise pollution during construction: construction activities (excavating and site clearing); construction vehicles; and construction staff. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Surrounding communities and adjacent landowners are to be notified upfront of noisy construction activities. * Provide all equipment with standard silencers. Maintain silencer units on vehicles and equipment on good working order. * All workers should be mandated to use noise reduction facilities such as ear plugs where noise levels are expected to be greater than 70db. * Construction activities are to be restricted to 8h00 to 17h00. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Ecological:**  * In the event of soil being washed away from cleared sites it could impact on nearby stream. * Disturbance of vegetation during digging of foundations and access road construction could trigger invasion of alien plants and spread of these into sensitive ecological areas. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 28 | * Site clearance should be restricted to demarcated areas only. * Minimise disturbance to vegetation in the area. * There should be long term monitoring of alien plants around the substation site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 |
| 1. **Stockpiles:**  * Incorrectly managed topsoil stockpiles may lead to the establishment of weeds/alien invasive species. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 20 | * Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Use of construction vehicles:**  * Damage to roads cause degradation of surrounding environment. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Construction vehicles should maintain a speed of 40 km per hour through residential areas and work site. * Contractor/Eskom should repair any damaged roads caused by construction vehicles. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Social:**  * Limited opportunities exist for manual labour for unskilled tasks, where the appointed contractor would be required to make use of local workers (e.g. for bush clearing, digging of foundations, tower assembly and erection, and stringing. * Movement of strangers and machinery may disrupt the social activities of community members. * Community may be exposed to safety risks from the movement of machinery. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Definite  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 16  **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * It is a requirement that local labour be utilised as far possible. * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Definite  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 16  **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| **CUMULATIVE** | | | |
| 1. **Flora:** Increase in local loss and fragmentation of habitat:  * Cumulative impacts associated with this type of development will lead to initial, incremental or augmentation of existing types of environmental degradation, including impacts on the air, soil and water present within available habitat. Pollution of these elements might not always be immediately visible or readily quantifiable, but incremental or fractional increases might rise to levels where biological attributes could be affected adversely on a local or regional scale. In most cases these effects are not bound and are dispersed, or diluted over an area that is much larger than the actual footprint of the causal factor. | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Mitigation implementation as recommended above. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Social:**  * Unmanaged construction activities may have increased direct and indirect impacts on livelihoods and safety of the community. The negative impact of unmanaged construction process may outweigh the benefits of the duration of employment opportunities available to the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * It is a requirement that local labour be utilised as far as possible. * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. * Construction workers need to be educated on community protocols. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |

**TABLE 6: SUBSTATION ALTERNATIVE SITE 3: CONSTRUCTION PHASE**

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| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Topography and Soils:**  * Stripping of soil may lead to soil erosion at the substation site. * Erosion may occur where top soil stockpiles are incorrectly managed. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 | * Disturbed areas of natural vegetation as well as cut and fill areas must be rehabilitated immediately after construction to prevent soil erosion. * Limit construction, maintenance and inspection activities to dry periods in order to curb occurrence or worsening of erosion in areas of existing erosion. * Soil erosion control measures shall be implemented. * The Contractor should provide a method statement on erosion control showing clearly how cleared surfaces and storm water will be managed on site during construction and rehabilitation of the site. * Remove and store topsoil separately in areas where excavation takes place. Topsoil should be used for rehabilitation purposes in order to facilitate re-growth of species that occur naturally in the area. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Ablution Facilities:**  * Pollution of ground water and surface water resources as a result of failure to supply clean ablution facilities. | **Duration:** Short-term (1)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 28 | * Adequate chemical toilets should be provided at camp site and on the work front. * Secured chemical toilets will be serviced weekly in accordance with appropriate health and safety standards. * No human waste will be allowed to enter water courses or natural drainage lines. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Spillage of hazardous chemicals:**  * Spillage of stored hazardous substances such as diesel can contaminate ground and surface water. | **Duration:** Short-term (1)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * Use and/or storage materials, fuels and chemicals which could potentially leak into the ground must be controlled. * Adequate spill kits and containers for spilled contaminated material to be on standby on site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Flora:**   **Vegetation clearing at substation site:**  Impacts may include:   * Increased runoff will cause soil and water loss. * Removal of indigenous, protected or endangered species. * Incorrect disposal of alien vegetation leading to rapid re-establishment. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** Very High (4)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 36 | * Vegetation may only be cleared within demarcated work area. * There should be no unnecessary removal of vegetation/plants which would leave soil exposed over a long period of time. * Alien invasive plant species are to be removed from any area within the construction area and be disposed of at a licensed landfill site. * The area should be re-vegetated upon completion of construction activities. * Cutting of trees for the purposes of pegging, firewood and any other activity should not occur. * Parking and turning of machinery should be at designated sites.. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 |
| 1. **Heritage:**  * Heritage studies conducted did not unearth any material of heritage significance at the site. However, materials may be subsurface which will only be discovered during earthworks. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 | * If any material is suspected to be of cultural or heritage significance, work at the site should be stopped and the occurrence should immediately be reported to AMAFA on 0333946543. The archaeologist should then investigate and evaluate the find. * NHRA requires that a developer cease all work immediately and adhere to the protocol described in section 9 of the HIA report (attached) should any heritage resources, as defined in the Act, be discovered during the course of development activities. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Waste:**  * Waste generation during construction phase will have a negative impact on the environment, if not controlled adequately. Waste includes general waste, construction rubble, hazardous waste (used oil, cement and concrete etc.). | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 | * Waste bins with lids will be provided on site for all waste pertaining to food and drinks. These shall be supplied in close proximity to the area where workers eat. * The site is to be checked for litter daily. All litter should be collected and deposited in waste bins. * Where possible, construction waste on site must be reused or recycled. * Disposal of waste must be in accordance with relevant legislative requirements. * Hazardous waste will be kept in correctly sealed storage bins in a shaded and bunded area. * The Contractors must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation. * Burning of waste material will not be permitted. * Further detailed mitigation measures are included in the EMP (Appendix G). | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Dust:**  * Generation of dust resulting in reduction in air quality. The following possible sources of fugitive dust have been identified as activities which could potentially generate dust during construction at the site: vehicle activities associated with the transport of equipment to the site; preparation of surface areas which may be required prior to the set up of new infrastructure; and the removal of construction equipment from site after the set up of new equipment. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 20 | * Frequent and effective dust suppression is advised, particularly along dirt roads. Dust must be suppressed on the construction site during dry periods by the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of runoff. * Stockpiles are to be covered with high density shade cloth or other similar material, appropriately pegged down, to assist in suppressing dust. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Noise:**  * During the construction phase there is likely to be an increase in noise pollution beyond the allowable residential threshold of 70 db. The following possible sources of noise could potentially generate noise pollution during construction: construction activities (excavating and site clearing); construction vehicles; and construction staff. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Surrounding communities and adjacent landowners are to be notified upfront of noisy construction activities. * Provide all equipment with standard silencers. Maintain silencer units on vehicles and equipment on good working order. * All workers should be mandated to use noise reduction facilities such as ear plugs where noise levels are expected to be greater than 70db. * Construction activities are to be restricted to 8h00 to 17h00. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Ecological:**  * In the event of soil being washed away from cleared sites it could impact on nearby stream. * Disturbance of vegetation during digging of foundations and access road construction could trigger invasion of alien plants and spread of these into sensitive ecological areas. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 28 | * Site clearance should be restricted to demarcated areas only. * Minimise disturbance to vegetation in the area. * There should be long term monitoring of alien plants around the substation site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 |
| 1. **Stockpiles:**  * Incorrectly managed topsoil stockpiles may lead to the establishment of weeds/alien invasive species. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 20 | * Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Use of construction vehicles:**  * Damage to roads cause degradation of surrounding environment. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Construction vehicles should maintain a speed of 40 km per hour through residential areas and work site. * Contractor/Eskom should repair any damaged roads caused by construction vehicles. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Social:**  * Limited opportunities exist for manual labour for unskilled tasks, where the appointed contractor would be required to make use of local workers (e.g. for bush clearing, digging of foundations, tower assembly and erection, and stringing. * Movement of strangers and machinery may disrupt the social activities of community members. * Community may be exposed to safety risks from the movement of machinery. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Definite  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 16  **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * It is a requirement that local labour be utilised as far possible. * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Definite  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 16  **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| **CUMULATIVE** | | | |
| 1. **Flora:** Increase in local loss and fragmentation of habitat:  * Cumulative impacts associated with this type of development will lead to initial, incremental or augmentation of existing types of environmental degradation, including impacts on the air, soil and water present within available habitat. Pollution of these elements might not always be immediately visible or readily quantifiable, but incremental or fractional increases might rise to levels where biological attributes could be affected adversely on a local or regional scale. In most cases these effects are not bound and are dispersed, or diluted over an area that is much larger than the actual footprint of the causal factor. | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Mitigation implementation as recommended above. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Social:**  * Unmanaged construction activities may have increased direct and indirect impacts on livelihoods and safety of the community. The negative impact of unmanaged construction process may outweigh the benefits of the duration of employment opportunities available to the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * It is a requirement that local labour be utilised as far as possible. * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. * Construction workers need to be educated on community protocols. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |

**TABLE 7: SUBSTATION ALTERNATIVE SITE 4 (PREFERRED ALTERNATIVE SITE): CONSTRUCTION PHASE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Topography and Soils:**  * Stripping of soil may lead to soil erosion at the substation site. * Erosion may occur where top soil stockpiles are incorrectly managed. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 | * Disturbed areas of natural vegetation as well as cut and fill areas must be rehabilitated immediately after construction to prevent soil erosion. * Limit construction, maintenance and inspection activities to dry periods in order to curb occurrence or worsening of erosion in areas of existing erosion. * Soil erosion control measures shall be implemented. * The Contractor should provide a method statement on erosion control showing clearly how cleared surfaces and storm water will be managed on site during construction and rehabilitation of the site. * Remove and store topsoil separately in areas where excavation takes place. Topsoil should be used for rehabilitation purposes in order to facilitate re-growth of species that occur naturally in the area. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Ablution Facilities:**  * Pollution of ground water and surface water resources as a result of failure to supply clean ablution facilities. | **Duration:** Short-term (1)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 28 | * Adequate chemical toilets should be provided at camp site and on the work front. * Secured chemical toilets will be serviced weekly in accordance with appropriate health and safety standards. * No human waste will be allowed to enter water courses or natural drainage lines. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Spillage of hazardous chemicals:**  * Spillage of stored hazardous substances such as diesel can contaminate ground and surface water. | **Duration:** Short-term (1)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * Use and/or storage materials, fuels and chemicals which could potentially leak into the ground must be controlled. * Adequate spill kits and containers for spilled contaminated material to be on standby on site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Flora:**   **Vegetation clearing at substation site:**  Impacts may include:   * Increased runoff will cause soil and water loss. * Removal of indigenous, protected or endangered species. * Incorrect disposal of alien vegetation leading to rapid re-establishment. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 28 | * Vegetation may only be cleared within demarcated work area. * There should be no unnecessary removal of vegetation/plants which would leave soil exposed over a long period of time. * Alien invasive plant species are to be removed from any area within the construction area and be disposed of at a licensed landfill site. * The area should be re-vegetated upon completion of construction activities. * Cutting of trees for the purposes of pegging, firewood and any other activity should not occur. * Parking and turning of machinery should be at designated sites.. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Heritage:**  * Heritage studies conducted did not unearth any material of heritage significance at the site. However, materials may be subsurface which will only be discovered during earthworks. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 | * If any material is suspected to be of cultural or heritage significance, work at the site should be stopped and the occurrence should immediately be reported to AMAFA on 0333946543. The archaeologist should then investigate and evaluate the find. * NHRA requires that a developer cease all work immediately and adhere to the protocol described in section 9 of the HIA report (attached) should any heritage resources, as defined in the Act, be discovered during the course of development activities. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Waste:**  * Waste generation during construction phase will have a negative impact on the environment, if not controlled adequately. Waste includes general waste, construction rubble, hazardous waste (used oil, cement and concrete etc.). | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 | * Waste bins with lids will be provided on site for all waste pertaining to food and drinks. These shall be supplied in close proximity to the area where workers eat. * The site is to be checked for litter daily. All litter should be collected and deposited in waste bins. * Where possible, construction waste on site must be reused or recycled. * Disposal of waste must be in accordance with relevant legislative requirements. * Hazardous waste will be kept in correctly sealed storage bins in a shaded and bunded area. * The Contractors must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation. * Burning of waste material will not be permitted. * Further detailed mitigation measures are included in the EMP (Appendix G). | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Dust:**  * Generation of dust resulting in reduction in air quality. The following possible sources of fugitive dust have been identified as activities which could potentially generate dust during construction at the site: vehicle activities associated with the transport of equipment to the site; preparation of surface areas which may be required prior to the set up of new infrastructure; and the removal of construction equipment from site after the set up of new equipment. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 20 | * Frequent and effective dust suppression is advised, particularly along dirt roads. Dust must be suppressed on the construction site during dry periods by the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of runoff. * Stockpiles are to be covered with high density shade cloth or other similar material, appropriately pegged down, to assist in suppressing dust. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Noise:**  * During the construction phase there is likely to be an increase in noise pollution beyond the allowable residential threshold of 70 db. The following possible sources of noise could potentially generate noise pollution during construction: construction activities (excavating and site clearing); construction vehicles; and construction staff. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Surrounding communities and adjacent landowners are to be notified upfront of noisy construction activities. * Provide all equipment with standard silencers. Maintain silencer units on vehicles and equipment on good working order. * All workers should be mandated to use noise reduction facilities such as ear plugs where noise levels are expected to be greater than 70db. * Construction activities are to be restricted to 8h00 to 17h00. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Ecological:**  * In the event of soil being washed away from cleared sites it could impact on nearby stream. * Disturbance of vegetation during digging of foundations and access road construction could trigger invasion of alien plants and spread of these into sensitive ecological areas. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Site clearance should be restricted to demarcated areas only. * Minimise disturbance to vegetation in the area. * There should be long term monitoring of alien plants around the substation site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Stockpiles:**  * Incorrectly managed topsoil stockpiles may lead to the establishment of weeds/alien invasive species. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 20 | * Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Use of construction vehicles:**  * Damage to roads cause degradation of surrounding environment. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Construction vehicles should maintain a speed of 40 km per hour through residential areas and work site. * Contractor/Eskom should repair any damaged roads caused by construction vehicles. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Social:**  * Limited opportunities exist for manual labour for unskilled tasks, where the appointed contractor would be required to make use of local workers (e.g. for bush clearing, digging of foundations, tower assembly and erection, and stringing. * Movement of strangers and machinery may disrupt the social activities of community members. * Community may be exposed to safety risks from the movement of machinery. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Definite  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 16  **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * It is a requirement that local labour be utilised as far possible. * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Definite  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 16  **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| **CUMULATIVE** | | | |
| 1. **Flora:** Increase in local loss and fragmentation of habitat:  * Cumulative impacts associated with this type of development will lead to initial, incremental or augmentation of existing types of environmental degradation, including impacts on the air, soil and water present within available habitat. Pollution of these elements might not always be immediately visible or readily quantifiable, but incremental or fractional increases might rise to levels where biological attributes could be affected adversely on a local or regional scale. In most cases these effects are not bound and are dispersed, or diluted over an area that is much larger than the actual footprint of the causal factor. | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Mitigation implementation as recommended above. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Social:**  * Unmanaged construction activities may have increased direct and indirect impacts on livelihoods and safety of the community. The negative impact of unmanaged construction process may outweigh the benefits of the duration of employment opportunities available to the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * It is a requirement that local labour be utilised as far as possible. * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. * Construction workers need to be educated on community protocols. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |

**TABLE 8: SUMMARY OF IMPACTS AND SIGNIFICANCE RATINGS DURING CONSTRUCTION.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Alternative Substation Site 2** | | | | **Alternative Substation Site 3** | | | | **Alternative Substation Site 4: Preferred Site** | | | |
| **IMPACTS** | **Without mitigation** | | **With mitigation** | | **Without mitigation** | | **With mitigation** | | **Without mitigation** | | **With mitigation** | |
| DIRECT |  |  |  |  |  |  |  |  |  |  |  |  |
| Topography and soils | Med | -32 | Low | -10 | Med | -32 | Low | -10 | Med | -32 | Low | -10 |
| Ablution facilities | Med | -28 | Low | -10 | Med | -28 | Low | -10 | Med | -28 | Low | -10 |
| Spillage of hazardous materials | Med | -21 | Low | -10 | Med | -21 | Low | -10 | Med | -21 | Low | -10 |
| Flora | High | -36 | Low | -15 | High | -36 | Low | -15 | Med | -28 | Low | -12 |
| Heritage | Low | -12 | Low | -8 | Low | -12 | Low | -8 | Low | -12 | Low | -8 |
| Waste | Low | -32 | Low | -12 | Med | -32 | Low | -12 | Med | -32 | Low | -12 |
| Dust | Med | -20 | Low | -8 | Med | -20 | Low | -8 | Med | -20 | Low | -8 |
| Noise | Low | -15 | Low | -8 | Low | -15 | Low | -8 | Low | -15 | Low | -8 |
| **Total** |  | **-196** |  | **-81** |  | **-196** |  | **-81** |  | **-188** |  | **-78** |
| INDIRECT |  |  |  |  |  |  |  |  |  |  |  |  |
| Ecological | Med | -28 | Low | -15 | Med | -28 | Low | -15 | Med | -24 | Low | -12 |
| Stockpiles | Med | -20 | Low | -8 | Med | -20 | Low | -8 | Med | -20 | Low | -8 |
| Use of construction vehicles | Low | -15 | Low | -8 | Low | -15 | Low | -8 | Low | -15 | Low | -8 |
| Social | Low | 16 | Low | 16 | Low | 16 | Low | 16 | Low | 16 | Low | 16 |
| Low | -15 | Low | -12 | Low | -15 | Low | -12 | Low | -15 | Low | -12 |
| **Total** |  | **-62** |  | **-27** |  | **-62** |  | **-27** |  | **-58** |  | **-24** |
| CUMULATIVE |  |  |  |  |  |  |  |  |  |  |  |  |
| Flora | Med | -24 | Low | -12 | Med | -24 | Low | -12 | Low | -15 | Low | -8 |
| Social | Low | -18 | Low | -10 | Low | -18 | Low | -10 | Low | -18 | Low | -10 |
| **Total** |  | **-42** |  | **-22** |  | **-42** |  | **-22** |  | **-33** |  | **-18** |
| **GRAND TOTAL** |  | **-300** |  | **-130** |  | **-300** |  | **-130** |  | **-279** |  | **-120** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
| **OPERATION PHASE** | | | | | | |

**TABLE 9: SUBTATION ALTERNATIVE SITE 2: OPERATION PHASE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Hazardous materials:**  * Spillage of hazardous materials may occur during routine maintenance or during an accident. This may impact on nearby water bodies (stream) | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 27 | * Spill Prevention Plan and Management Plan must be put in place prior to any maintenance activity that involves the use of oil, lubricants and other hazardous materials. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Waste:**  * Waste generation during the operation phase will have a negative impact on the environment if not controlled adequately.Waste includes general waste or hazardous waste (used oil etc). | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Where possible, construction waste on site must be reused or recycled. * Disposal of waste must be in accordance with relevant legislative requirements. * The responsible maintenance personnel must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation. * Burning of waste materials will not be permitted. * Further detailed mitigation measures are included on the EMP (Appendix G) | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Flora:**  * Surrounding areas and species present in the direct vicinity of the substation could be affected by indirect impacts resulting from operation activities. Examples include:   + Unlawful parking and turning of maintenance vehicles and machinery.   + Unlawful storage or dumping of materials outside substation perimeter.   + Unlawful harvesting of natural resources (trees, flowers, muthi, fruits).   + Unlawful use of surrounding vegetation (e.g. for ablution purposes). | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Ensure no parking, turning of vehicles or dumping of material outside the perimeter of the substation. * All workers on site must be:   + Informed that there should be no harvesting of natural resources.   + There should be no dumping or littering outside the perimeter of the substation.   + Surrounding are must not be used for ablution purposes. * During operation phase there is a need to implement alien plant monitoring and control. Even though this impact may have been triggered at the planning and construction stage, it is necessary to include monitoring and control of alien plants as part of operational activities. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Socio-economic:**  * The availability of more power may stimulate local economic development leading to an increase in the standard of living for local households. * The increased electricity supply may reduce dependency on other energy sources (e.g. firewood) thereby leading to better resource management and conservation. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 18 |  | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 24 |
| 1. **Noise:**  * Frequent humming noise would be a nuisance to the community. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * No new settlement should be allowed within 100 m of the substation. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 |
| 1. **Electromagnetic Fields:**  * There have been complaints from households that are located close to substations that there is distortion of radio and TV transmission. This could be due to interference from EMF that emanate from the substation. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * In general, it is not recommended that people should live under power lines due to the effects of EMF. However, the radiation decreases with increase in distance from the source. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Safety and security:**  * There is the potential risk of electrocution (of people and livestock) if access to the site is not controlled. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * Eskom must ensure that security fencing is not easily damaged. * Eskom should undertake regular maintenance of security fence and repair any damage. * Safety and security issues should be addressed as a priority by Eskom. It is recommended that landowners and affected community members be contacted in advance to ensure that they are forewarned of the construction and maintenance activities planned in the area. In addition, the local community must be educated about the dangers of high voltage electricity. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Visual:**  * The visual impact of the proposed substation will depend on the structures used and visual qualities of the structures, and on the nature of the receiving environment (ecological and visual sensitivity). | **Duration:** Permanent (4)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 | * Ensure that security lights are directed towards the substation to minimise glare. * Painting of the substation infrastructure should blend with the environment. | **Duration:** Permanent (4)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 28 |
| **CUMULATIVE** | | | |
| 1. **Flora:**  * Potential impacts on the surrounding vegetation through dumping and removal of vegetation coupled with impacts due to trucks, storage of materials could make the condition of the surrounding vegetation worse than if the substation were not constructed. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * All necessary precautions as listed above need to be strictly implemented. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |

**TABLE 10: SUBTATION ALTERNATIVE SITE 3: OPERATION PHASE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Hazardous materials:**  * Spillage of hazardous materials may occur during routine maintenance or during an accident. This may impact on nearby water bodies (stream) | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 27 | * Spill Prevention Plan and Management Plan must be put in place prior to any maintenance activity that involves the use of oil, lubricants and other hazardous materials. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Waste:**  * Waste generation during the operation phase will have a negative impact on the environment if not controlled adequately.Waste includes general waste or hazardous waste (used oil etc). | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Where possible, construction waste on site must be reused or recycled. * Disposal of waste must be in accordance with relevant legislative requirements. * The responsible maintenance personnel must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation. * Burning of waste materials will not be permitted. * Further detailed mitigation measures are included on the EMP (Appendix G) | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Flora:**  * Surrounding areas and species present in the direct vicinity of the substation could be affected by indirect impacts resulting from operation activities. Examples include:   + Unlawful parking and turning of maintenance vehicles and machinery.   + Unlawful storage or dumping of materials outside substation perimeter.   + Unlawful harvesting of natural resources (trees, flowers, muthi, fruits).   + Unlawful use of surrounding vegetation (e.g. for ablution purposes). | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Ensure no parking, turning of vehicles or dumping of material outside the perimeter of the substation. * All workers on site must be:   + Informed that there should be no harvesting of natural resources.   + There should be no dumping or littering outside the perimeter of the substation.   + Surrounding are must not be used for ablution purposes. * During operation phase there is a need to implement alien plant monitoring and control. Even though this impact may have been triggered at the planning and construction stage, it is necessary to include monitoring and control of alien plants as part of operational activities. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Socio-economic:**  * The availability of more power may stimulate local economic development leading to an increase in the standard of living for local households. * The increased electricity supply may reduce dependency on other energy sources (e.g. firewood) thereby leading to better resource management and conservation. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 18 |  | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 24 |
| 1. **Noise:**  * Frequent humming noise would be a nuisance to the community. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * No new settlement should be allowed within 100 m of the substation. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 |
| 1. **Electromagnetic Fields:**  * There have been complaints from households that are located close to substations that there is distortion of radio and TV transmission. This could be due to interference from EMF that emanate from the substation. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * In general, it is not recommended that people should live under power lines due to the effects of EMF. However, the radiation decreases with increase in distance from the source. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Safety and security:**  * There is the potential risk of electrocution (of people and livestock) if access to the site is not controlled. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * Eskom must ensure that security fencing is not easily damaged. * Eskom should undertake regular maintenance of security fence and repair any damage. * Safety and security issues should be addressed as a priority by Eskom. It is recommended that landowners and affected community members be contacted in advance to ensure that they are forewarned of the construction and maintenance activities planned in the area. In addition, the local community must be educated about the dangers of high voltage electricity. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Visual:**  * The visual impact of the proposed substation will depend on the structures used and visual qualities of the structures, and on the nature of the receiving environment (ecological and visual sensitivity). | **Duration:** Permanent (4)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 | * Ensure that security lights are directed towards the substation to minimise glare. * Painting of the substation infrastructure should blend with the environment. | **Duration:** Permanent (4)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 28 |
| **CUMULATIVE** | | | |
| 1. **Flora:**  * Potential impacts on the surrounding vegetation through dumping and removal of vegetation coupled with impacts due to trucks, storage of materials could make the condition of the surrounding vegetation worse than if the substation were not constructed. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * All necessary precautions as listed above need to be strictly implemented. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |

**TABLE 11: SUBTATION ALTERNATIVE SITE 4: (PREFERRED SITE) OPERATION PHASE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Hazardous materials:**  * Spillage of hazardous materials may occur during routine maintenance or during an accident. This may impact on nearby water bodies (stream) | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 27 | * Spill Prevention Plan and Management Plan must be put in place prior to any maintenance activity that involves the use of oil, lubricants and other hazardous materials. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Waste:**  * Waste generation during the operation phase will have a negative impact on the environment if not controlled adequately.Waste includes general waste or hazardous waste (used oil etc). | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Where possible, construction waste on site must be reused or recycled. * Disposal of waste must be in accordance with relevant legislative requirements. * The responsible maintenance personnel must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation. * Burning of waste materials will not be permitted. * Further detailed mitigation measures are included on the EMP (Appendix G) | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Flora:**  * Surrounding areas and species present in the direct vicinity of the substation could be affected by indirect impacts resulting from operation activities. Examples include:   + Unlawful parking and turning of maintenance vehicles and machinery.   + Unlawful storage or dumping of materials outside substation perimeter.   + Unlawful harvesting of natural resources (trees, flowers, muthi, fruits).   + Unlawful use of surrounding vegetation (e.g. for ablution purposes). | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Ensure no parking, turning of vehicles or dumping of material outside the perimeter of the substation. * All workers on site must be:   + Informed that there should be no harvesting of natural resources.   + There should be no dumping or littering outside the perimeter of the substation.   + Surrounding are must not be used for ablution purposes. * During operation phase there is a need to implement alien plant monitoring and control. Even though this impact may have been triggered at the planning and construction stage, it is necessary to include monitoring and control of alien plants as part of operational activities. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Socio-economic:**  * The availability of more power may stimulate local economic development leading to an increase in the standard of living for local households. * The increased electricity supply may reduce dependency on other energy sources (e.g. firewood) thereby leading to better resource management and conservation. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 18 |  | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 24 |
| 1. **Noise:**  * Frequent humming noise would be a nuisance to the community. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * No new settlement should be allowed within 100 m of the substation. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 |
| 1. **Electromagnetic Fields:**  * There have been complaints from households that are located close to substations that there is distortion of radio and TV transmission. This could be due to interference from EMF that emanate from the substation. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * In general, it is not recommended that people should live under power lines due to the effects of EMF. However, the radiation decreases with increase in distance from the source. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Safety and security:**  * There is the potential risk of electrocution (of people and livestock) if access to the site is not controlled. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * Eskom must ensure that security fencing is not easily damaged. * Eskom should undertake regular maintenance of security fence and repair any damage. * Safety and security issues should be addressed as a priority by Eskom. It is recommended that landowners and affected community members be contacted in advance to ensure that they are forewarned of the construction and maintenance activities planned in the area. In addition, the local community must be educated about the dangers of high voltage electricity. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Visual:**  * The visual impact of the proposed substation will depend on the structures used and visual qualities of the structures, and on the nature of the receiving environment (ecological and visual sensitivity). | **Duration:** Permanent (4)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 | * Ensure that security lights are directed towards the substation to minimise glare. * Painting of the substation infrastructure should blend with the environment. | **Duration:** Permanent (4)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 28 |
| **CUMULATIVE** | | | |
| 1. **Flora:**  * Potential impacts on the surrounding vegetation through dumping and removal of vegetation coupled with impacts due to trucks, storage of materials could make the condition of the surrounding vegetation worse than if the substation were not constructed. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * All necessary precautions as listed above need to be strictly implemented. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |

**TABLE 12: SUMMARY OF IMPACTS AND SIGNIFICANCE RATINGS DURING OPERATION PHASE.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Alternative Substation Site 2** | | | | **Alternative Substation Site 3** | | | | **Alternative Substation Site 4:Preferred Site** | | | |
| **IMPACTS** | **Without mitigation** | | **With mitigation** | | **Without mitigation** | | **With mitigation** | | **Without mitigation** | | **With mitigation** | |
| DIRECT |  |  |  |  |  |  |  |  |  |  |  |  |
| Hazardous materials | Med | -27 | Low | -10 | Med | -27 | Low | -10 | Med | -27 | Low | -10 |
| Waste | Low | -18 | Low | -8 | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| **Total** |  | **-45** |  | **-18** |  | **-45** |  | **-18** |  | **-45** |  | **-18** |
| INDIRECT |  |  |  |  |  |  |  |  |  |  |  |  |
| Flora | Low | -18 | Low | -8 | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| Socio-economic | Low | 18 | Med | 24 | Low | 18 | Med | 24 | Low | 18 | Med | 24 |
| Noise | Med | -21 | Low | -18 | Med | -21 | Low | -18 | Med | -21 | Low | -18 |
| Electromagnetic fields | Med | -21 | Low | -12 | Med | -21 | Low | -12 | Med | -21 | Low | -12 |
| Safety and security | Med | -21 | Low | -12 | Med | -21 | Low | -12 | Med | -21 | Low | -12 |
| Visual | Med | -32 | Med | -28 | Med | -32 | Med | -28 | Med | -32 | Med | -28 |
| **Total** |  | **-95** |  | **-54** |  | **-95** |  | **-54** |  | **-95** |  | **-54** |
| CUMULATIVE |  |  |  |  |  |  |  |  |  |  |  |  |
| Flora | Low | -18 | Low | -8 | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| **Total** |  | **-18** |  | **-8** |  | **-18** |  | **-8** |  | **-18** |  | **-8** |
| **GRAND TOTAL** |  | **-158** |  | **-80** |  | **-158** |  | **-80** |  | **-158** |  | **-80** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
| **DECOMMISSIONING AND CLOSURE** | | | | | | |

**TABLE 13: SUBTATION ALTERNATIVE SITE 2: DECOMMISSIONING AND CLOSURE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Waste:**  * Waste generation during the decommissioning phase will have a negative impact on the environment, if not controlled effectively. Waste includes general waste or hazardous waste.  1. **General waste** 2. **Hazardous waste**  * Spillage of hazardous material and oils are major contaminants of surface and ground water. * Transformers contain oil and during decommissioning the oil could spill. * Care needs to be taken during decommissioning to avoid fire outbreaks caused by oils in transformers. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12  **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Disposal of waste must be in accordance with relevant legislative requirements. * Waste must be disposed of in the appropriate manner at a licensed disposal site. * Routine checks should be made for any signs of damage to the oil dam structures. * Fire safety measures need to be put in place. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8  **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Erosion:**  * The substation site must be rehabilitated after removal of structures to avoid soil erosion. * All areas outside the substation site that are disturbed during the decommissioning phase must be rehabilitated. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Rehabilitation of areas affected by construction activities should ideally commence at the start of the raining season (September). * Recommended rehabilitation is in the form of active re-vegetation of affected areas, including areas where surface disturbances resulted from construction. * All areas where construction has been completed should be prepared for rehabilitation. * All areas where topsoil was removed should be landscaped in order to reflect surrounding conditions. * Erosion monitoring and control should be conducted. This should be in the form of inspections subsequent to rains. Topsoil should be replaced in all areas that were eroded. It is critical that adequate topsoil remains in construction areas, implying that topsoil might need to be supplemented in some areas until such time that a layer of vegetation has stabilised the soil. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Pollution:**  * The disposal of transformers which contain oils may pollute at the disposal site and other environments to which the pollutant may be carried. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Dispose of waste at a registered landfill site. * Specialised personnel with experience in the disposal of transformers must be employed. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Colonisation of alien plants:**  * The removal of substation has the potential to create an environment for the introduction and colonisation of alien plants. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * The area should be immediately re-established with indigenous vegetation. * The area should be monitored for the presence and removal of alien plants. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **CUMULATIVE IMPACTS** | | | |
| 1. **Flora:**  * The removal of the substation and subsequent reversal of the area to a natural/green environment would result in a positive impact and would enhance the general biodiversity in the area. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 12 |  | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 |

**TABLE 14: SUBTATION ALTERNATIVE SITE 3: DECOMMISSIONING AND CLOSURE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Waste:**  * Waste generation during the decommissioning phase will have a negative impact on the environment, if not controlled effectively. Waste includes general waste or hazardous waste.  1. **General waste** 2. **Hazardous waste**  * Spillage of hazardous material and oils are major contaminants of surface and ground water. * Transformers contain oil and during decommissioning the oil could spill. * Care needs to be taken during decommissioning to avoid fire outbreaks caused by oils in transformers. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12  **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Disposal of waste must be in accordance with relevant legislative requirements. * Waste must be disposed of in the appropriate manner at a licensed disposal site. * Routine checks should be made for any signs of damage to the oil dam structures. * Fire safety measures need to be put in place. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8  **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Erosion:**  * The substation site must be rehabilitated after removal of structures to avoid soil erosion. * All areas outside the substation site that are disturbed during the decommissioning phase must be rehabilitated. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Rehabilitation of areas affected by construction activities should ideally commence at the start of the raining season (September). * Recommended rehabilitation is in the form of active re-vegetation of affected areas, including areas where surface disturbances resulted from construction. * All areas where construction has been completed should be prepared for rehabilitation * All areas where topsoil was removed should be landscaped in order to reflect surrounding conditions. * Erosion monitoring and control should be conducted. This should be in the form of inspections subsequent to rains. Topsoil should be replaced in all areas that were eroded. It is critical that adequate topsoil remains in construction areas, implying that topsoil might need to be supplemented in some areas until such time that a layer of vegetation has stabilised the soil. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Pollution:**  * The disposal of transformers which contain oils may pollute at the disposal site and other environments to which the pollutant may be carried. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Dispose of waste at a registered landfill site. * Specialised personnel with experience in the disposal of transformers must be employed. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Colonisation of alien plants:**  * The removal of substation has the potential to create an environment for the introduction and colonisation of alien plants. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * The area should be immediately re-established with indigenous vegetation. * The area should be monitored for the presence and removal of alien plants. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **CUMULATIVE IMPACTS** | | | |
| 1. **Flora:**  * The removal of the substation and subsequent reversal of the area to a natural/green environment would result in a positive impact and would enhance the general biodiversity in the area. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 12 |  | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 |

**TABLE 15: SUBTATION ALTERNATIVE SITE 4 (PREFERRED SUBSTATION SITE): DECOMMISSIONING AND CLOSURE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Waste:**  * Waste generation during the decommissioning phase will have a negative impact on the environment, if not controlled effectively. Waste includes general waste or hazardous waste.  1. **General waste** 2. **Hazardous waste**  * Spillage of hazardous material and oils are major contaminants of surface and ground water. * Transformers contain oil and during decommissioning the oil could spill. * Care needs to be taken during decommissioning to avoid fire outbreaks caused by oils in transformers. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12  **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Disposal of waste must be in accordance with relevant legislative requirements. * Waste must be disposed of in the appropriate manner at a licensed disposal site. * Routine checks should be made for any signs of damage to the oil dam structures. * Fire safety measures need to be put in place. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8  **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Erosion:**  * The substation site must be rehabilitated after removal of structures to avoid soil erosion. * All areas outside the substation site that are disturbed during the decommissioning phase must be rehabilitated. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Rehabilitation of areas affected by construction activities should ideally commence at the start of the raining season (September). * Recommended rehabilitation is in the form of active re-vegetation of affected areas, including areas where surface disturbances resulted from construction. * All areas where construction has been completed should be prepared for rehabilitation. * All areas where topsoil was removed should be landscaped in order to reflect surrounding conditions. * Erosion monitoring and control should be conducted. This should be in the form of inspections subsequent to rains. Topsoil should be replaced in all areas that were eroded. It is critical that adequate topsoil remains in construction areas, implying that topsoil might need to be supplemented in some areas until such time that a layer of vegetation has stabilised the soil. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Pollution:**  * The disposal of transformers which contain oils may pollute at the disposal site and other environments to which the pollutant may be carried. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Dispose of waste at a registered landfill site. * Specialised personnel with experience in the disposal of transformers must be employed. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Colonisation of alien plants:**  * The removal of substation has the potential to create an environment for the introduction and colonisation of alien plants. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * The area should be immediately re-established with indigenous vegetation. * The area should be monitored for the presence and removal of alien plants. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **CUMULATIVE IMPACTS** | | | |
| 1. **Flora:**  * The removal of the substation and subsequent reversal of the area to a natural/green environment would result in a positive impact and would enhance the general biodiversity in the area. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 12 |  | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 |

**TABLE 16: SUMMARY OF IMPACTS AND SIGNIFICANCE RATINGS DURING DECOMMISSIONING AND CLOSURE PHASE.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Alternative Substation Site 2** | | | | **Alternative Substation Site 3** | | | | **Alternative Substation Site 4** | | | |
| **IMPACTS** | **Without mitigation** | | **With mitigation** | | **Without mitigation** | | **With mitigation** | | **Without mitigation** | | **With mitigation** | |
| DIRECT |  |  |  |  |  |  |  |  |  |  |  |  |
| Waste – General | Low | -12 | Low | -8 | Low | -12 | Low | -8 | Low | -12 | Low | -8 |
| Waste – Hazardous | Med | -24 | Low | -10 | Med | -24 | Low | -10 | Med | -24 | Low | -10 |
| Erosion | Low | -18 | Low | -8 | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| **Total** |  | **-54** |  | **-26** |  | **-54** |  | **-26** |  | **-54** |  | **-26** |
| INDIRECT |  |  |  |  |  |  |  |  |  |  |  |  |
| Pollution | Med | -24 | Low | -8 | Med | -24 | Low | -8 | Med | -24 | Low | -8 |
| Colonisation of alien plants | Low | -18 | Low | -8 | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| **Total** |  | **-42** |  | **-16** |  | **-42** |  | **-16** |  | **-42** |  | **-16** |
| CUMULATIVE |  |  |  |  |  |  |  |  |  |  |  |  |
| Flora | Low | 12 | Med | 32 | Low | 12 | Med | 32 | Low | 12 | Med | 32 |
| **Total** |  | **12** |  | **32** |  | **12** |  | **32** |  | **12** |  | **32** |
| **GRAND TOTAL** |  | **-84** |  | **-10** |  | **-84** |  | **-10** |  | **-84** |  | **-10** |

|  |
| --- |
| **PLANNING AND DESIGN PHASE** |

**TABLE 17: ALTERNATIVE TURN IN LINE CORRIDOR 1: PLANNING AND DESIGN PHASE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Flora:**  * Survey requires;   + Pegging of sites that need to be visible so some amount of vegetation would have to be removed/cleared.   + Movement of vehicles during survey could impact vegetation. * Geotechnical investigations will involve the use of heavy machinery;   + Moving machinery impacts vegetation.   + Test pits also impact on vegetation.   + Stock piles impact on vegetation.   + Topsoil may be lost through erosion. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 20 | * A walk about during surveys must be considered than using vehicles to access the area. * Existing access routes must be used. * Movement and turning of heavy equipment should be restricted to the roads and less sensitive areas. * Test pits should be backfilled immediately after assessment. * In backfilling surrounding vegetation should not be destroyed. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Access Roads:**  * New access roads may impact on areas of high sensitivity (natural vegetation, protected tree species, etc). * Upgrading of existing roads may impact on sensitive environments. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Use should be made of existing roads as far as possible. * Site clearance should be restricted to demarcated areas only. * Minimise disturbance to vegetation in the area. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Ecological:**  * In the event of soil being washed away from test pits it could impact on sensitive vegetation. * Disturbance of vegetation and geotechnical investigation sites could trigger invasion of alien plants and spread of these into sensitive ecological areas. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Test pits should be far from sensitive sites as much as possible. * Backfilling should be done as soon as possible. * Minimise disturbance to vegetation in the area. * There should be long-term monitoring of alien plants around the substation site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Social:**  * Movement of strangers and machinery may disrupt the social activities of community members. * Community may be exposed to safety risks from the movement of machinery. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **CUMULATIVE** | | | |
| 1. **Ecological and Social impacts**  * There are ecological and social impacts that if not planned for could result in higher impacts than if the development were not implemented. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * The mitigation measures indicated above should be considered during planning. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |

**TABLE 18: ALTERNATIVE TURN IN LINE CORRIDOR 2 (PREFERRED CORRIDOR): PLANNING AND DESIGN PHASE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Flora:**  * Survey requires;   + Pegging of sites that need to be visible so some amount of vegetation would have to be removed/cleared.   + Movement of vehicles during survey could impact vegetation. * Geotechnical investigations will involve the use of heavy machinery;   + Moving machinery impacts vegetation.   + Test pits also impact on vegetation.   + Stock piles impact on vegetation.   + Topsoil may be lost through erosion. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * A walk about during surveys must be considered than using vehicles to access the area. * Existing access routes must be used. * Movement and turning of heavy equipment should be restricted to the roads and less sensitive areas. * Test pits should be backfilled immediately after assessment. * In backfilling surrounding vegetation should not be destroyed. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Access Roads:**  * New access roads may impact on areas of high sensitivity (natural vegetation, protected tree species, etc). * Upgrading of existing roads may impact on sensitive environments. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Use should be made of existing roads as far as possible. * Site clearance should be restricted to demarcated areas only. * Minimise disturbance to vegetation in the area. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Ecological:**  * In the event of soil being washed away from test pits it could impact on sensitive vegetation. * Disturbance of vegetation and geotechnical investigation sites could trigger invasion of alien plants and spread of these into sensitive ecological areas. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Test pits should be far from sensitive sites as much as possible. * Backfilling should be done as soon as possible. * Minimise disturbance to vegetation in the area. * There should be long-term monitoring of alien plants around the substation site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Social:**  * Movement of strangers and machinery may disrupt the social activities of community members. * Community may be exposed to safety risks from the movement of machinery. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **CUMULATIVE** | | | |
| 1. **Ecological and Social impacts**  * There are ecological and social impacts that if not planned for could result in higher impacts than if the development were not implemented. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * The mitigation measures indicated above should be considered during planning. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |

**TABLE 19: SUMMARY OF IMPACTS AND SIGNIFICANCE RATINGS DURING PLANNING AND DESIGN PHASE**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Alternative Turn In Line Corridor 1** | | | | **Alternative Turn In Line Corridor 2** | | | |
| **IMPACTS** | **Without mitigation** | | **With mitigation** | | **Without mitigation** | | **With mitigation** | |
| DIRECT |  |  |  |  |  |  |  |  |
| Flora | Med | -20 | Low | -8 | Low | -15 | Low | -8 |
| Access roads | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| **Total** |  | **-38** |  | **-16** |  | **-33** |  | **-16** |
| INDIRECT |  |  |  |  |  |  |  |  |
| Ecological | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| Social | Low | -15 | Low | -8 | Low | -15 | Low | -8 |
| **Total** |  | **-33** |  | **-16** |  | **-33** |  | **-16** |
| CUMULATIVE |  |  |  |  |  |  |  |  |
| Ecological and Social | Med | -21 | Low | -12 | Med | -21 | Low | -12 |
| **GRAND TOTAL** |  | **-92** |  | **-44** |  | **-87** |  | **-44** |

|  |
| --- |
| **CONSTRUCTION PHASE** |

**TABLE 20: ALTERNATIVE TURN IN LINE CORRIDOR 1: CONSTRUCTION PHASE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Topography and Soils:**  * Stripping of soil may lead to soil erosion at the tower position. * Erosion may occur where top soil stockpiles are incorrectly managed. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Disturbed areas of natural vegetation as well as cut and fill areas must be rehabilitated immediately after construction to prevent soil erosion. * Limit construction, maintenance and inspection activities to dry periods in order to curb occurrence or worsening of erosion in areas of existing erosion. * Soil erosion control measures shall be implemented. * The Contractor should provide a method statement on erosion control showing clearly how cleared surfaces and storm water will be managed on site during construction and rehabilitation of the site. * Remove and store topsoil separately in areas where excavation takes place. Topsoil should be used for rehabilitation purposes in order to facilitate re-growth of species that occur naturally in the area. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 |
| 1. **Ablution Facilities:**  * Pollution of ground water and surface water resources as a result of failure to supply clean ablution facilities. | **Duration:** Short-term (1)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 28 | * Adequate chemical toilets should be provided at camp site and on the work front. * Secured chemical toilets will be serviced weekly in accordance with appropriate health and safety standards. * No human waste will be allowed to enter water courses or natural drainage lines. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Spillage of hazardous chemicals:**  * Spillage of stored hazardous substances such as diesel can contaminate ground and surface water. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 28 | * Use and/or storage materials, fuels and chemicals which could potentially leak into the ground must be controlled. * Adequate spill kits and containers for spilled contaminated material to be on standby on site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Flora:**   **Vegetation clearing at tower positions:**  Impacts may include:   * Increased runoff will cause soil and water loss. * Removal of indigenous, protected or endangered species. * Incorrect disposal of alien vegetation leading to rapid re-establishment. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** Very High (4)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 36 | * Vegetation may only be cleared within demarcated work area. * There should be no unnecessary removal of vegetation/plants which would leave soil exposed over a long period of time. * Alien invasive plant species are to be removed from any area within the construction area and be disposed of at a licensed landfill site. * The area should be re-vegetated upon completion of construction activities. * Parking and turning of machinery should be at designated sites. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May to occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 |
| 1. **Heritage:**  * Heritage studies conducted did not unearth any material of heritage significance in the area, However, materials may be subsurface which will only be discovered during earthworks. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 | * If any material is suspected to be of cultural or heritage significance, work at the site should be stopped and the occurrence should immediately be reported to AMAFA on 0333946543. The archaeologist should then investigate and evaluate the find. * NHRA requires that a developer cease all work immediately and adhere to the protocol described in section 9 of the HIA report (attached) should any heritage resources, as defined in the Act, be discovered during the course of development activities. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Waste:**  * Waste generation during construction phase will have a negative impact on the environment, if not controlled adequately. Waste includes general waste, construction rubble, hazardous waste (used oil, cement and concrete etc.). | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:**28 | * Waste bins with lids will be provided on site for all waste pertaining to food and drinks. These shall be supplied in close proximity to the area where workers eat. * The site is to be checked for litter daily. All litter should be collected and deposited in waste bins. * Where possible, construction waste on site must be reused or recycled. * Disposal of waste must be in accordance with relevant legislative requirements. * Hazardous waste will be kept in correctly sealed storage bins in a shaded and bunded area. * The Contractors must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation. * Burning of waste material will not be permitted. * Further detailed mitigation measures are included in the EMP (Appendix G). | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Dust:**  * Generation of dust resulting in reduction in air quality. The following possible sources of fugitive dust have been identified as activities which could potentially generate dust during construction at the site: vehicle activities associated with the transport of equipment to the site; preparation of surface areas which may be required prior to the set up of new infrastructure; and the removal of construction equipment from site after the set up of new equipment. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Frequent and effective dust suppression is advised, particularly along dirt roads. Dust must be suppressed on the construction site during dry periods by the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of runoff. * Stockpiles are to be covered with high density shade cloth or other similar material, appropriately pegged down, to assist in suppressing dust. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Noise:**  * During the construction phase there is likely to be an increase in noise pollution beyond the allowable residential threshold of 70 db. The following possible sources of noise could potentially generate noise pollution during construction: construction activities (excavating and site clearing); construction vehicles; and construction staff. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Surrounding communities and adjacent landowners are to be notified upfront of noisy construction activities. * Provide all equipment with standard silencers. Maintain silencer units on vehicles and equipment on good working order. * All workers should be mandated to use noise reduction facilities such as ear plugs. where noise levels are greater than 70db. * Construction activities are to be restricted to 8h00 to 17h00. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Ecological:**  * In the event of soil being washed away from cleared sites it could impact on nearby streams. * Disturbance of vegetation during digging of foundations and access road construction could trigger invasion of alien plants and spread of these into sensitive ecological areas. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 | * Site clearance should be restricted to demarcated areas only. * Minimise disturbance to vegetation in the area. * There should be long term monitoring of alien plants around the substation site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Stockpiles:**  * Incorrectly managed topsoil stockpiles may lead to the establishment of weeds/alien invasive species. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Use of construction vehicles:**  * Damage to roads cause degradation of surrounding environment. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 20 | * Construction vehicles should maintain a speed of 40 km per hour through residential areas and work site. * Contractor/Eskom should repair any damaged roads caused by construction vehicles. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Social:**  * Limited opportunities exist for manual labour for unskilled tasks, where the appointed contractor would be required to make use of local workers (e.g. for bush clearing, digging of foundations, tower assembly and erection, and stringing. * Movement of strangers and machinery may disrupt the social activities of community members. * Community may be exposed to safety risks from the movement of machinery. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 16  **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * It is a requirement that local labour be utilised as far possible. * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 16  **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **CUMULATIVE** | | | |
| 1. **Flora:** Increase in local loss and fragmentation of habitat:  * Cumulative impacts associated with this type of development will lead to initial, incremental or augmentation of existing types of environmental degradation, including impacts on the air, soil and water present within available habitat. Pollution of these elements might not always be immediately visible or readily quantifiable, but incremental or fractional increases might rise to levels where biological attributes could be affected adversely on a local or regional scale. In most cases these effects are not bound and are dispersed, or diluted over an area that is much larger than the actual footprint of the causal factor. | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Mitigation implementation as recommended above. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Social:**  * Unmanaged construction activities may have increased direct and indirect impacts on livelihoods and safety of the community. The negative impact of unmanaged construction process may outweigh the benefits of the duration of employment opportunities available to the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * It is a requirement that local labour be utilised as far as possible. * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. * Construction workers need to be educated on community protocols. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |

**TABLE 21: ALTERNATIVE TURN IN LINE CORRIDOR 2 (PREFERRED TIL CORRIDOR): CONSTRUCTION PHASE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Topography and Soils:**  * Stripping of soil may lead to soil erosion at the tower position. * Erosion may occur where top soil stockpiles are incorrectly managed. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Disturbed areas of natural vegetation as well as cut and fill areas must be rehabilitated immediately after construction to prevent soil erosion. * Limit construction, maintenance and inspection activities to dry periods in order to curb occurrence or worsening of erosion in areas of existing erosion. * Soil erosion control measures shall be implemented. * The Contractor should provide a method statement on erosion control showing clearly how cleared surfaces and storm water will be managed on site during construction and rehabilitation of the site. * Remove and store topsoil separately in areas where excavation takes place. Topsoil should be used for rehabilitation purposes in order to facilitate re-growth of species that occur naturally in the area. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 |
| 1. **Ablution Facilities:**  * Pollution of ground water and surface water resources as a result of failure to supply clean ablution facilities. | **Duration:** Short-term (1)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 28 | * Adequate chemical toilets should be provided at camp site and on the work front. * Secured chemical toilets will be serviced weekly in accordance with appropriate health and safety standards. * No human waste will be allowed to enter water courses or natural drainage lines. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Spillage of hazardous chemicals:**  * Spillage of stored hazardous substances such as diesel can contaminate ground and surface water. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 28 | * Use and/or storage materials, fuels and chemicals which could potentially leak into the ground must be controlled. * Adequate spill kits and containers for spilled contaminated material to be on standby on site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Flora:**   **Vegetation clearing at tower positions:**  Impacts may include:   * Increased runoff will cause soil and water loss. * Removal of indigenous, protected or endangered species. * Incorrect disposal of alien vegetation leading to rapid re-establishment. | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 | * Vegetation may only be cleared within demarcated work area. * There should be no unnecessary removal of vegetation/plants which would leave soil exposed over a long period of time. * Alien invasive plant species are to be removed from any area within the construction area and be disposed of at a licensed landfill site. * The area should be re-vegetated upon completion of construction activities. * Parking and turning of machinery should be at designated sites. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May to occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Heritage:**  * Heritage studies conducted did not unearth any material of heritage significance in the area, However, materials may be subsurface which will only be discovered during earthworks. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 | * If any material is suspected to be of cultural or heritage significance, work at the site should be stopped and the occurrence should immediately be reported to AMAFA on 0333946543. The archaeologist should then investigate and evaluate the find. * NHRA requires that a developer cease all work immediately and adhere to the protocol described in section 9 of the HIA report (attached) should any heritage resources, as defined in the Act, be discovered during the course of development activities. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Waste:**  * Waste generation during construction phase will have a negative impact on the environment, if not controlled adequately. Waste includes general waste, construction rubble, hazardous waste (used oil, cement and concrete etc.). | **Duration:** Medium-term (2)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:**28 | * Waste bins with lids will be provided on site for all waste pertaining to food and drinks. These shall be supplied in close proximity to the area where workers eat. * The site is to be checked for litter daily. All litter should be collected and deposited in waste bins. * Where possible, construction waste on site must be reused or recycled. * Disposal of waste must be in accordance with relevant legislative requirements. * Hazardous waste will be kept in correctly sealed storage bins in a shaded and bunded area. * The Contractors must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation. * Burning of waste material will not be permitted. * Further detailed mitigation measures are included in the EMP (Appendix G). | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Dust:**  * Generation of dust resulting in reduction in air quality. The following possible sources of fugitive dust have been identified as activities which could potentially generate dust during construction at the site: vehicle activities associated with the transport of equipment to the site; preparation of surface areas which may be required prior to the set up of new infrastructure; and the removal of construction equipment from site after the set up of new equipment. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Frequent and effective dust suppression is advised, particularly along dirt roads. Dust must be suppressed on the construction site during dry periods by the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of runoff. * Stockpiles are to be covered with high density shade cloth or other similar material, appropriately pegged down, to assist in suppressing dust. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Noise:**  * During the construction phase there is likely to be an increase in noise pollution beyond the allowable residential threshold of 70 db. The following possible sources of noise could potentially generate noise pollution during construction: construction activities (excavating and site clearing); construction vehicles; and construction staff. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Surrounding communities and adjacent landowners are to be notified upfront of noisy construction activities. * Provide all equipment with standard silencers. Maintain silencer units on vehicles and equipment on good working order. * All workers should be mandated to use noise reduction facilities such as ear plugs. where noise levels are greater than 70db. * Construction activities are to be restricted to 8h00 to 17h00. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Ecological:**  * In the event of soil being washed away from cleared sites it could impact on nearby streams. * Disturbance of vegetation during digging of foundations and access road construction could trigger invasion of alien plants and spread of these into sensitive ecological areas. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Site clearance should be restricted to demarcated areas only. * Minimise disturbance to vegetation in the area. * There should be long term monitoring of alien plants around the substation site. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** No  **Irreplaceable loss of resources:** Yes  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Stockpiles:**  * Incorrectly managed topsoil stockpiles may lead to the establishment of weeds/alien invasive species. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Use of construction vehicles:**  * Damage to roads cause degradation of surrounding environment. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 20 | * Construction vehicles should maintain a speed of 40 km per hour through residential areas and work site. * Contractor/Eskom should repair any damaged roads caused by construction vehicles. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| 1. **Social:**  * Limited opportunities exist for manual labour for unskilled tasks, where the appointed contractor would be required to make use of local workers (e.g. for bush clearing, digging of foundations, tower assembly and erection, and stringing. * Movement of strangers and machinery may disrupt the social activities of community members. * Community may be exposed to safety risks from the movement of machinery. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 16  **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * It is a requirement that local labour be utilised as far possible. * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 16  **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **CUMULATIVE** | | | |
| 1. **Flora:** Increase in local loss and fragmentation of habitat:  * Cumulative impacts associated with this type of development will lead to initial, incremental or augmentation of existing types of environmental degradation, including impacts on the air, soil and water present within available habitat. Pollution of these elements might not always be immediately visible or readily quantifiable, but incremental or fractional increases might rise to levels where biological attributes could be affected adversely on a local or regional scale. In most cases these effects are not bound and are dispersed, or diluted over an area that is much larger than the actual footprint of the causal factor. | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Mitigation implementation as recommended above. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Social:**  * Unmanaged construction activities may have increased direct and indirect impacts on livelihoods and safety of the community. The negative impact of unmanaged construction process may outweigh the benefits of the duration of employment opportunities available to the community. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * It is a requirement that local labour be utilised as far as possible. * Local leadership needs to be informed of proposed activities. * Signs should be erected to notify the community. * Construction workers need to be educated on community protocols. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |

**TABLE 22: SUMMARY OF IMPACTS AND SIGNIFICANCE RATINGS OF ALTERNATIVE TURN IN LINE CORRIDORS DURING CONSTRUCTION PHASE**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Alternative Turn In Line Corridor 1** | | | | **Alternative Turn In Line Corridor 2** | | | |
| **IMPACTS** | **Without mitigation** | | **With mitigation** | | **Without mitigation** | | **With mitigation** | |
| DIRECT |  |  |  |  |  |  |  |  |
| Topography and soils | Med | -20 | Low | -8 | Med | -20 | Low | -8 |
| Ablution facilities | Med | -24 | Low | -8 | Med | -24 | Low | -8 |
| Spillage of hazardous chemicals | Med | -21 | Low | -8 | Med | -21 | Low | -8 |
| Flora | Med | -24 | Low | -8 | Med | -24 | Low | -8 |
| Heritage | Low | -12 | Low | -8 | Low | -12 | Low | -8 |
| Waste | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| Dust | Low | -15 | Low | -8 | Low | -15 | Low | -8 |
| Noise | Low | -15 | Low | -8 | Low | -15 | Low | -8 |
| **Total** |  | **-181** |  | **-92** |  | **-181** |  | **-92** |
| INDIRECT |  |  |  |  |  |  |  |  |
| Ecological | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| Stockpiles | Low | -15 | Low | -8 | Low | -15 | Low | -8 |
| Use of construction vehicles | Low | -15 | Low | -8 | Low | -15 | Low | -8 |
| Social | Low | 16 | Low | 16 | Low | 16 | Low | 16 |
| Low | -15 | Low | -8 | Low | -15 | Low | -8 |
| **Total** |  | **-68** |  | **-26** |  | **-57** |  | **-20** |
| CUMULATIVE |  |  |  |  |  |  |  |  |
| Flora | Med | -24 | Low | -8 | Med | -24 | Low | -8 |
| Social | Low | -15 | Low | -8 | Low | -15 | Low | -8 |
| **Total** |  | **-39** |  | **-16** |  | **-39** |  | **-16** |
| **GRAND TOTAL** |  | **-288** |  | **-134** |  | **-277** |  | **-128** |

|  |
| --- |
| **OPERATION PHASE** |

**TABLE 23: ALTERNATIVE TURN IN LINE CORRIDOR 1: OPERATION PHASE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Avifauna**  * Collision with power lines. * Possible bird electrocution. | **Duration:** Permanent (4)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * The pylons associated with this line should be of a ‘bird-friendly’ nature with respect to electrocution risks. Apparently, as steel-lattice structures, they should be inherently safe in this regard. * Relevant to bird-power-line collision risks and coming out of the field inspection, there does not seem grounds to predict significant bird movements in the immediate area of this short stretch of power line and therefore no mitigation in the form of line marking seems warranted at this stage. The proposed routes do not traverse any major watercourses or wetland where waterbirds, a group particularly vulnerable to collisions, could be of concern. | **Duration:** Permanent (4)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:**21 |
| 1. **Hazardous materials:**  * Spillage of hazardous materials may occur during routine maintenance or during an accident. This may impact on nearby water bodies (streams) | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 24 | * Spill Prevention Plan and Management Plan must be put in place prior to any maintenance activity that involves the use of oil, lubricants and other hazardous materials. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Waste:**  * Waste generation during the operation phase will have a negative impact on the environment if not controlled adequately.Waste includes general waste or hazardous waste (used oil etc). | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Where possible, construction waste on site must be reused or recycled. * Disposal of waste must be in accordance with relevant legislative requirements. * The responsible maintenance personnel must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation. * Burning of waste materials will not be permitted. * Further detailed mitigation measures are included on the EMP (Appendix G) | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Flora:**  * Surrounding areas and species present in the direct vicinity of the TIL servitude could be affected by indirect impacts resulting from operation activities. Examples include:   + Unlawful parking and turning of maintenance vehicles and machinery.   + Unlawful storage or dumping of materials outside substation perimeter.   + Unlawful harvesting of natural resources (trees, flowers, muthi, fruits).   + Unlawful use of surrounding vegetation (e.g. for ablution purposes). | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Ensure no parking, turning of vehicles or dumping of material outside the perimeter of the TIL servitude. * All workers on site must be:   + Informed that there should be no harvesting of natural resources.   + There should be no dumping or littering outside the perimeter of the TIL servitude.   + Surrounding are must not be used for ablution purposes. * During operation phase there is a need to implement alien plant monitoring and control. Even though this impact may have been triggered at the planning and construction stage, it is necessary to include monitoring and control of alien plants as part of operational activities. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Socio-economic:**  * The availability of more power may stimulate local economic development leading to an increase in the standard of living for local households. * The increased electricity supply may reduce dependency on other energy sources (e.g. firewood) thereby leading to better resource management and conservation. | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 24 |  | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 27 |
| 1. **Safety and security:**  * There is the potential risk of electrocution (of people and livestock) if access to the site is not controlled. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * Eskom must ensure that security fencing is not easily damaged. * Eskom should undertake regular maintenance of security fence and repair any damage. * Safety and security issues should be addressed as a priority by Eskom. It is recommended that landowners and affected community members be contacted in advance to ensure that they are forewarned of the construction and maintenance activities planned in the area. In addition, the local community must be educated about the dangers of high voltage electricity. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| **CUMULATIVE** | | | |
| 1. **Flora:**  * Potential impacts on the surrounding vegetation through dumping and removal of vegetation coupled with impacts due to trucks, storage of materials could make the condition of the surrounding vegetation worse than if the substation were not constructed. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * All necessary precautions as listed above need to be strictly implemented. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |

**TABLE 24: ALTERNATIVE TURN IN LINE CORRIDOR 2 (PREFERRED TIL CORRIDOR): OPERATION PHASE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Avifauna**  * Collision with power lines. * Possible bird electrocution. | **Duration:** Permanent (4)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * The pylons associated with this line should be of a ‘bird-friendly’ nature with respect to electrocution risks. Apparently, as steel-lattice structures, they should be inherently safe in this regard. * Relevant to bird-power-line collision risks and coming out of the field inspection, there does not seem grounds to predict significant bird movements in the immediate area of this short stretch of power line and therefore no mitigation in the form of line marking seems warranted at this stage. The proposed routes do not traverse any major watercourses or wetland where waterbirds, a group particularly vulnerable to collisions, could be of concern. | **Duration:** Permanent (4)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:**21 |
| 1. **Hazardous materials:**  * Spillage of hazardous materials may occur during routine maintenance or during an accident. This may impact on nearby water bodies (streams) | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** Low (1)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * Spill Prevention Plan and Management Plan must be put in place prior to any maintenance activity that involves the use of oil, lubricants and other hazardous materials. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 10 |
| 1. **Waste:**  * Waste generation during the operation phase will have a negative impact on the environment if not controlled adequately.Waste includes general waste or hazardous waste (used oil etc). | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Where possible, construction waste on site must be reused or recycled. * Disposal of waste must be in accordance with relevant legislative requirements. * The responsible maintenance personnel must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation. * Burning of waste materials will not be permitted. * Further detailed mitigation measures are included on the EMP (Appendix G) | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Flora:**  * Surrounding areas and species present in the direct vicinity of the TIL servitude could be affected by indirect impacts resulting from operation activities. Examples include:   + Unlawful parking and turning of maintenance vehicles and machinery.   + Unlawful storage or dumping of materials outside substation perimeter.   + Unlawful harvesting of natural resources (trees, flowers, muthi, fruits).   + Unlawful use of surrounding vegetation (e.g. for ablution purposes). | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Ensure no parking, turning of vehicles or dumping of material outside the perimeter of the TIL servitude. * All workers on site must be:   + Informed that there should be no harvesting of natural resources.   + There should be no dumping or littering outside the perimeter of the TIL servitude.   + Surrounding are must not be used for ablution purposes. * During operation phase there is a need to implement alien plant monitoring and control. Even though this impact may have been triggered at the planning and construction stage, it is necessary to include monitoring and control of alien plants as part of operational activities. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Socio-economic:**  * The availability of more power may stimulate local economic development leading to an increase in the standard of living for local households. * The increased electricity supply may reduce dependency on other energy sources (e.g. firewood) thereby leading to better resource management and conservation. | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 24 |  | **Duration:** Long-term (3)  **Extent:** Regional (3)  **Intensity:** High (3)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 27 |
| 1. **Safety and security:**  * There is the potential risk of electrocution (of people and livestock) if access to the site is not controlled. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 21 | * Eskom must ensure that security fencing is not easily damaged. * Eskom should undertake regular maintenance of security fence and repair any damage. * Safety and security issues should be addressed as a priority by Eskom. It is recommended that landowners and affected community members be contacted in advance to ensure that they are forewarned of the construction and maintenance activities planned in the area. In addition, the local community must be educated about the dangers of high voltage electricity. | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Unsure  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 12 |
| **CUMULATIVE** | | | |
| 1. **Flora:**  * Potential impacts on the surrounding vegetation through dumping and removal of vegetation coupled with impacts due to trucks, storage of materials could make the condition of the surrounding vegetation worse than if the substation were not constructed. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * All necessary precautions as listed above need to be strictly implemented. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Definite  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |

**TABLE 25: SUMMARY OF IMPACTS AND SIGNIFICANCE RATINGS OF ALTERNATIVE TURN IN LINE CORRIDORS DURING OPERATION PHASE**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Alternative Turn In Line Corridor 1** | | | | **Alternative Turn In Line Corridor 2** | | | |
| **IMPACTS** | **Without mitigation** | | **With mitigation** | | **Without mitigation** | | **With mitigation** | |
| DIRECT |  |  |  |  |  |  |  |  |
| Avifauna | Med | -24 | Med | -21 | Med | -24 | Med | -21 |
| Hazardous materials | Med | -24 | Low | -10 | Med | -24 | Low | -10 |
| Waste | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| **Total** |  | **-66** |  | **-39** |  | **-66** |  | **-39** |
| INDIRECT |  |  |  |  |  |  |  |  |
| Flora | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| Socio-economic | Med | 24 | Med | 27 | Med | 24 | Med | 27 |
| Safety and security | Med | -21 | Low | -12 | Med | -21 | Low | -12 |
| **Total** |  | **-36** |  | **-5** |  | **-36** |  | **-5** |
| CUMULATIVE |  |  |  |  |  |  |  |  |
| Flora | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| **Total** |  | **-18** |  | **-8** |  | **-18** |  | **-8** |
| **GRAND TOTAL** |  | **-120** |  | **-52** |  | **-120** |  | **-52** |

|  |
| --- |
| **DECOMMISSIONING AND CLOSURE PHASE** |

**TABLE 26: ALTERNATIVE TIL CORRIDOR 1: DECOMMISSIONING AND CLOSURE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Waste:**  * Waste generation during the decommissioning phase will have a negative impact on the environment, if not controlled effectively. Waste includes steel, conductors and concrete from tower foundations. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Disposal of waste must be in accordance with relevant legislative requirements. * Waste must be disposed of in the appropriate manner at a licensed disposal site. * Routine checks should be made for any signs of damage to the oil dam structures. * Fire safety measures need to be put in place. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Erosion:**  * The tower positions must be rehabilitated after removal of structures to avoid soil erosion. * All areas outside the tower positions that are disturbed during the decommissioning phase must be rehabilitated. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Rehabilitation of areas affected by construction activities should ideally commence at the start of the raining season (September). * Recommended rehabilitation is in the form of active re-vegetation of affected areas, including areas where surface disturbances resulted from construction. * All areas where construction has been completed should be prepared for rehabilitation. * All areas where topsoil was removed should be landscaped in order to reflect surrounding conditions. * Erosion monitoring and control should be conducted. This should be in the form of inspections subsequent to rains. Topsoil should be replaced in all areas that were eroded. It is critical that adequate topsoil remains in construction areas, implying that topsoil might need to be supplemented in some areas until such time that a layer of vegetation has stabilised the soil. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Alien plants:**  * Alien plants may proliferate and colonise servitude and tower positions. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Servitude and especially tower positions need to be monitored for the presence and removal of alien plants for at least two years. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **CUMULATIVE IMPACTS** | | | |
| 1. **Flora:**  * The removal of the towers and subsequent reversal of the area to a natural/green environment would result in a positive impact and would enhance the general biodiversity in the area. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 24 |  | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 |

**TABLE 27: ALTERNATIVE TIL CORRIDOR 2 (PREFERRED CORRIDOR): DECOMMISSIONING AND CLOSURE**

|  |  |  |  |
| --- | --- | --- | --- |
| **POTENTIAL IMPACTS** | **SIGNIFICANCE OF IMPACTS** | **PROPOSED MITIGATION** | **SIGNIFICANCE OF IMPACTS AFTER MITIGATION** |
| **DIRECT IMPACTS** | | | |
| 1. **Waste:**  * Waste generation during the decommissioning phase will have a negative impact on the environment, if not controlled effectively. Waste includes steel, conductors and concrete from tower foundations. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 15 | * Disposal of waste must be in accordance with relevant legislative requirements. * Waste must be disposed of in the appropriate manner at a licensed disposal site. * Routine checks should be made for any signs of damage to the oil dam structures. * Fire safety measures need to be put in place. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| 1. **Erosion:**  * The tower positions must be rehabilitated after removal of structures to avoid soil erosion. * All areas outside the tower positions that are disturbed during the decommissioning phase must be rehabilitated. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Rehabilitation of areas affected by construction activities should ideally commence at the start of the raining season (September). * Recommended rehabilitation is in the form of active re-vegetation of affected areas, including areas where surface disturbances resulted from construction. * All areas where construction has been completed should be prepared for rehabilitation.. * All areas where topsoil was removed should be landscaped in order to reflect surrounding conditions. * Erosion monitoring and control should be conducted. This should be in the form of inspections subsequent to rains. Topsoil should be replaced in all areas that were eroded. It is critical that adequate topsoil remains in construction areas, implying that topsoil might need to be supplemented in some areas until such time that a layer of vegetation has stabilised the soil. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **INDIRECT IMPACTS** | | | |
| 1. **Alien plants:**  * Alien plants may proliferate and colonise servitude and tower positions. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** May occur (3)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 18 | * Servitude and especially tower positions need to be monitored for the presence and removal of alien plants for at least two years. | **Duration:** Short-term (1)  **Extent:** Local (2)  **Intensity:** Low (1)  **Probability of occurrence:** Unlikely to occur (2)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 8 |
| **CUMULATIVE IMPACTS** | | | |
| 1. **Flora:**  * The removal of the towers and subsequent reversal of the area to a natural/green environment would result in a positive impact and would enhance the general biodiversity in the area. | **Duration:** Medium-term (2)  **Extent:** Local (2)  **Intensity:** Moderate (2)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Positive  **Reversibility:** N/A  **Irreplaceable loss of resources:** N/A  **Can impacts be mitigated?** N/A  **Significance Rating:** 24 |  | **Duration:** Long-term (3)  **Extent:** Local (2)  **Intensity:** High (3)  **Probability of occurrence:** Will definitely occur (4)  **Degree of confidence/certainty:** Probable  **Status:** Negative  **Reversibility:** Yes  **Irreplaceable loss of resources:** No  **Can impacts be mitigated?** Yes  **Significance Rating:** 32 |

**TABLE 28: SUMMARY OF IMPACTS AND SIGNIFICANCE RATINGS OF ALTERNATIVE TURN IN LINE CORRIDORS DURING DECOMMISSIONING AND CLOSURE PHASE.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Alternative Turn In Line Corridor 1** | | | | **Alternative Turn In Line Corridor 2** | | | |
| **IMPACTS** | **Without mitigation** | | **With mitigation** | | **Without mitigation** | | **With mitigation** | |
| DIRECT |  |  |  |  |  |  |  |  |
| Waste | Low | -15 | Low | -8 | Low | -15 | Low | -8 |
| Erosion | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| **Total** |  | **-33** |  | **-16** |  | **-33** |  | **-16** |
| INDIRECT |  |  |  |  |  |  |  |  |
| Alien plants | Low | -18 | Low | -8 | Low | -18 | Low | -8 |
| **Total** |  | **-18** |  | **-8** |  | **-18** |  | **-8** |
| CUMULATIVE |  |  |  |  |  |  |  |  |
| Flora | Med | 24 | Med | 32 | Med | 24 | Med | 32 |
| **Total** |  | **24** |  | **32** |  | **24** |  | **32** |
| **GRAND TOTAL** |  | **-27** |  | **8** |  | **-27** |  | **8** |

**TABLE 29: OVERALL IMPACT OF ALTERNATIVE SUBSTATION SITES.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Alternative Substation Site 2** | | **Alternative Substation Site 3** | | **Alternative Substation Site 4 (Preferred Site)** | |
|  | **Without mitigation** | **With mitigation** | **Without mitigation** | **With mitigation** | **Without mitigation** | **With mitigation** |
| Planning and Design Phase | -195 | -44 | -195 | -44 | -95 | -44 |
| Construction Phase | -300 | -130 | -300 | -130 | -279 | -120 |
| Operation Phase | -158 | -80 | -158 | -80 | -158 | -80 |
| Decommissioning and Closure Phase | -84 | -10 | -84 | -10 | -84 | -10 |
| **Total** | **-637** | **-264** | **-637** | **-264** | **-616** | **-254** |

The overall impact shown in Table 29 shows that Alternative Site 4 has the least negative environmental impact (without (-616) and with mitigation (-254) and is recommended for implementation. The highest negative impacts will be experienced during construction (Table 29 ).

**TABLE 30: TOTAL IMPACT OF ALTERNATIVE TIL CORRIDORS.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Alternative Turn In Line**  **Corridor 1** | | **Alternative Turn In Line**  **Corridor 2** | |
| **IMPACTS** | **Without mitigation** | **With mitigation** | **Without mitigation** | **With mitigation** |
| Planning and Design Phase | -92 | -44 | -87 | -44 |
| Construction Phase | -288 | -134 | -277 | -128 |
| Operation Phase | -120 | -52 | -120 | -52 |
| Decommissioning and Closure Phase | -27 | 8 | -27 | 8 |
| **Total** | **-527** | **-222** | **-511** | **-216** |

The total impact shown in Table 30 shows that Alternative Turn In Line corridor 2 has the least negative environmental impact (without (-511) and with mitigation (-216)) and is recommended for implementation.

A complete impact assessment in terms of Regulation 22(2)(i) of GN R.543 must be included as Appendix F.

1. **Environmental impact statement**

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

**There is no wetland within the project area nor is there a wetland within 500 m of the study area. No water courses will be traversed by the preferred Turn In Line 2 corridor. According to Section 21 (c) and 21 (i) of the National Water Act a water use licence may be required where a development occurs within 500 m radius of a wetland or water course. A water use license application will not likely need to be submitted to the Department of Water Affairs.**

|  |
| --- |
| **Alternative Substation Site 4 (preferred alternative)** |
| Alternative Site 4 is the preferred alternative site as it has the lowest negative impacts based on the impact assessment above (Table 29).  According to the **Botanist** (Ecological Review Report in Appendix D) Substation Sites 2,3 and 4 show general ecological similarity comparative to Site 1. The **recommended site for the placement of the substation is on Alternative Site 1** to the east of the district road and adjacent (or inclusive) of the soccer field. Site 1 shows the lowest botanical diversity of the 4 sites, with limited land form variation, some significant anthropogenic alteration and the option of utilising the existing district road as a “buffer”. **Should the above site not be found suitable due to other constraints, then it is recommended that site 4** be considered for the establishment of the substation.  .  According to **Heritage Impact Assessment** (Heritage Impact Assessment Report in Appendix D), Site Alternative 1 is least preferable; Site Alternatives 2 and 3 are feasible options; and Site Alternative 4 is the most preferred substation location option.  Based on the **Avifaunal Specialist report** (Appendix D), of the four proposed substation site options, Site 1 is considered the preferred option. This is because it occurs directly adjacent to areas already heavily modified by humans, i.e. for the local school and associated developments. Site 4 would be the next preferred option as it is similarly located alongside human settlement. Site 3 and, especially, 2 are the least preferred options as they are located relatively further from areas already completely transformed by human activities. |
| **Alternative Substation Site 2** |
| Alternative Sites 2 and 3 present the highest negative impact based on the impact assessment above (Table 29).  According to the **Botanist** (Ecological Review Report in Appendix D), Site 2 shows the greatest distance from the stream. However, the greatest number of individual species recorded within the transects were recorded on Site 2, limiting this site as the most optimal option for the positioning of the substation.  According to **Heritage Impact Assessment** (Heritage Impact Assessment Report in Appendix D), Site Alternative 1 is least preferable; Site Alternatives 2 and 3 are feasible options; and Site Alternative 4 is the most preferred substation location option.  Based on the **Avifaunal Specialist report** (Appendix D), of the four proposed substation site options, Site 1 is considered the preferred option. This is because it occurs directly adjacent to areas already heavily modified by humans, i.e. for the local school and associated developments. Site 4 would be the next preferred option as it is similarly located alongside human settlement. Site 3 and, especially, 2 are the least preferred options as they are located relatively further from areas already completely transformed by human activities. |
| **Alternative Substation Site 3** |
| Alternative Sites 2 and 3 present the highest negative impact based on the impact assessment above (Table 29).  According to **Botanist** (Ecological Review Report in Appendix D), alteration of the landform in and around Site 3 is likely to have significant repercussions in terms of drainage patterns with concomitant changes to the status of the drainage line and the biota within its confines. The report also indicates that Sites 2,3 and 4 show general ecological similarity comparative to Site 1.    According to **Heritage Impact Assessment** (Heritage Impact Assessment Report in Appendix D), Site Alternative 1 is least preferable; Site Alternatives 2 and 3 are feasible options; and Site Alternative 4 is the most preferred substation location option.  Based on the **Avifaunal Specialist report** (Appendix D), of the four proposed substation site options, Site 1 is considered the preferred option. This is because it occurs directly adjacent to areas already heavily modified by humans, i.e. for the local school and associated developments. Site 4 would be the next preferred option as it is similarly located alongside human settlement. Site 3 and, especially, 2 are the least preferred options as they are located relatively further from areas already completely transformed by human activities. |

**Two Turn In Line 400 m corridors were identified and investigated. Alternative TIL 2 is the preferred corridor (Table 30).**

**Alternative Turn In Line 2 corridor (Preferred Alternative)**

|  |
| --- |
| Alternative Turn In Line 2 is the preferred alternative site as it has the lowest negative impacts based on the impact assessment above (Table 30).  According to the Botanist (Ecological Review Report in Appendix D), the most optimal powerline route associated with the substation is Option 2, on account of its generally lower woody vegetation and existing transformation. If the line route is proximal to the road, larger woody specimens may be avoided. A seep zone has been noted along the route which may be avoided by judicious placement of supporting structures.  From an **avifaunal perspective** (Avifauna Specialist Report in Appendix D), of the two turn-in-line alternatives, there would appear little to choose between them from an avifaunal perspective and the preferred option should likely be based on alternative environmental (or other) factors. |

**Alternative Turn In Line 1**

|  |
| --- |
| Alternative Turn In Line 1 has the highest negative impact based on the impact assessment above (Table 30).  From an **avifaunal perspective** (Avifauna Specialist Report in Appendix D) of the two turn-in-line alternatives, there would appear little to choose between them from an avifaunal perspective and the preferred option should likely be based on alternative environmental (or other) factors.  According to the Botanical Specialist study (Appendix D), from a biophysical perspective line route Option 1 shows a steeper landform than Option 2, with increased woody presence (primarily Acacia – Dichrostachys associes). Hence it has higher negative impact on the environment. |