1. **SIGNIFICANCE scoring process**

**1. Nature of impact**

The environmental impacts of a project are those resultant changes in environmental parameters, in space and time, compared with what would have happened had the project not been undertaken. It is an appraisal of the type of effect the proposed activity would have on the affected environmental parameter. Its description should include what is being affected, and how.

**2. Spatial extent**

This addresses the physical and spatial scale of the impact. A series of standard terms relating to the spatial extent of an impact / effect are outlined in Table 1.

**Table 1** Rating scale for the assessment of the spatial extent of predicted effect / impact

|  |  |
| --- | --- |
| **Rating** | **Spatial descriptor** |
| 7 | International - The impacted area extends beyond national boundaries |
| 6 | National - The impacted area extends beyond provincial boundaries |
| 5 | Ecosystem - The impact could affect areas essentially linked to the property in terms of significantly impacting ecosystem functioning |
| 4 | Regional - The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns |
| 3 | Landscape - The impact could affect all areas generally visible to the naked eye, as well as those areas essentially linked to the property in terms of ecosystem functioning |
| 2 | Site related - The impacted area extends further than the actual physical disturbance footprint; the impact could affect the whole, or a measurable portion of a number of properties |
| 1 | Local - The impacted area extends only as far as the activity e.g. a footprint; the loss is considered inconsequential in terms of the spatial context of the relevant environmental aspect |

**3. Severity / Intensity / Magnitude**

A qualitative assessment of the severity of a predicted impact / effect was undertaken. Quantitative measures were undertaken wherever possible. A series of standard terms relating to the magnitude of an impact / effect are outlined in Table 2.

**Table 2** Rating scale for the assessment of the severity of a predicted effect / impact**[[1]](#footnote-1)**

|  |  |
| --- | --- |
| **Rating** | **Magnitude descriptor** |
| 7 | Total / consuming / eliminating - Function or process of the affected environment is altered to the extent that it is permanently changed |
| 6 | Profound / considerable / substantial - Function or process of the affected environment is altered to the extent where it is permanently modified to a sub-optimal state. In the case of positive impacts it is permanently modified to an improved state |
| 5 | Material / important - Function or process of the affected environment is altered to the extent where it is temporarily altered, be it in a positive or negative manner. |
| 4 | Discernible / noticeable - The affected environment is altered, but function and process continue, albeit in a modified way. |
| 3 | Marginal / slight / minor - The affected environment is altered, but natural function and process continue. |
| 2 | Unimportant / inconsequential / indiscernible - The impact alters the affected environment in such a way that the natural processes or functions are negligibly affected. |
| 1 | No effect / not applicable |

**4. Duration**

This describes the predicted lifetime of the impact.

**Table 3** Rating scale for the assessment of the temporal scale of a predicted effect / impact

|  |  |
| --- | --- |
| **Rating** | **Temporal descriptor** |
| 7 | Long-term – Permanent. Beyond decommissioning and cannot be negated on decommissioning. More than 15 years. |
| 3 | Medium term – Lifespan of the project. Reversible over time. 5 to 15 years. |
| 1 | Short-term – Quickly reversible. Less than the project lifespan. The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than any of the phases. 0 to 5 years. |

**5. Irreplaceable loss of resources**

Environmental resources cannot always be replaced; once destroyed, some may be lost forever. It may be possible to replace, compensate for or reconstruct a lost resource in some cases, but substitutions are rarely ideal. The loss of a resource may become more serious later, and assessment must take this into account.

**Table 4** Rating scale for the assessment of the loss of resources due to a predicted effect / impact

|  |  |
| --- | --- |
| **Rating** | **Resource loss descriptor** |
| 7 | Long-term – The loss of a non-renewable / threatened resource which cannot be renewed / recovered with or through natural process, in a time span of over 15 years, or by artificial means. |
| 5 | Long-term – The loss of a non-renewable / threatened resource which cannot be renewed / recovered with or through natural process, in a time span of over 15 years, but can be mitigated by other means. |
| 4 | Loss of an ‘at risk’ resource - one that is not deemed critical for biodiversity targets, planning goals, community welfare, agricultural production, or other criteria, but cumulative effects may render such loss as significant. |
| 3 | Medium term – The resource can be recovered within the lifespan of the project. The resource can be renewed / recovered with mitigation or will be mitigated through natural process in a span between 5 and 15 years. |
| 2 | Loss of an ‘expendable’ resource - one that is not deemed critical for biodiversity targets, planning goals, community welfare, agricultural production, or other criteria. |
| 1 | Short-term – Quickly recoverable. Less than the project lifespan. The resource can be renewed / recovered with mitigation or will be mitigated through natural process in a span shorter than any of the phases, or in a time span of 0 to 5 years. |

**6. Reversibility / potential for rehabilitation**

The distinction between reversible and irreversible impacts is a very important one, and the irreversible impacts, not susceptible to mitigation, can constitute significant impacts in an EIA (Glasson *et al*, 1999). The potential for rehabilitation is the major determinant factor when considering the temporal scale of most predicted impacts.

**Table 5** Rating scale for the assessment of reversibility of a predicted effect / impact

|  |  |
| --- | --- |
| **Rating** | **Reversibility descriptor** |
| 7 | Long-term – The impact / effect will never be returned to its benchmark state. |
| 3 | Medium term – The impact / effect will be returned to its benchmark state through mitigation or natural processes in a span shorter than the lifetime of the project, or in a time span between 5 and 15 years. |
| 1 | Short-term – The impact / effect will be returned to its benchmark state through mitigation or natural processes in a span shorter than any of the phases of the project, or in a time span of 0 to 5 years. |

**7. Probability**

An assessment of the probability of an impact / effect was undertaken in accordance with Table 6.

**Table 6** Rating scale for the assessment of the probability of a predicted effect / impact **[[2]](#footnote-2)**

|  |  |
| --- | --- |
| **Rating** | **Probability descriptor** |
| 1.0 | Absolute certainty |
| 0.9 | Near certainty / very high probability |
| 0.7 – 0.8 | High probability – to be expected |
| 0.4 - 0.6 | Likelihood / normal anticipation – to be anticipated |
| 0.3 | Seriously anticipated possibility |
| 0.2 | Possibility |
| 0.0 - 0.1 | Remote possibility |

**8. Mitigation**

The potential to mitigate the negative impacts and enhance the positive impacts should be determined for each identified impact, mitigation objectives that would result in a measurable reduction in impact should be provided. For each impact, practical mitigation measures that can affect the significance rating should be recommended. Management actions that could enhance the condition of the environment (i.e. potential positive impacts of the proposed project) should be identified. Where no mitigation is considered feasible, this must be stated and the reasons provided (DEAT, 2002).

The significance of environmental impacts will be assessed taking into account any proposed mitigations. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required.

**Table 7 Significance scoring of a (a) Negative impact / effect**

|  |  |
| --- | --- |
| **Scoring value** | **Significance** |
| 35 | Total / consuming / eliminating - In the case of adverse impacts, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time-consuming or some combination of these. Social, cultural and economic activities of communities are disrupted to such an extent that these come to a halt. Mitigation may not be possible / practical. Consider fatal flaw. |
| 26 - 34 | Profound - In the case of adverse impacts, there are few opportunities for mitigation that could offset the impact, or mitigation has a limited effect on the impact. Social, cultural and economic activities of communities are disrupted to such an extent that their operation is severely impeded. Mitigation may not be possible / practical. Consider fatal flaw. |
| 21 – 25 | Considerable / substantial - The impact is of great importance. Failure to mitigate with the objective of reducing the impact to acceptable levels could render the entire project option or entire project proposal unacceptable. Mitigation is therefore essential. |
| 8 – 20 | Material / important to investigate - The impact is of importance and is therefore considered to have a substantial impact. Mitigation is required to reduce the negative impacts and such impacts need to be evaluated carefully. |
| 5 – 7 | Marginal / slight / minor - The impact is of little importance, but may require limited mitigation; or it may be rendered acceptable in light of proposed mitigation. |
| 0 – 4 | Unimportant / inconsequential / indiscernible; or it may be rendered acceptable in light of proposed mitigation. |

**(b) Positive impact / effect**

|  |  |
| --- | --- |
| **Scoring value** | **Significance** |
| 16 - 21 | Very highly beneficial |
| 12 – 15 | Highly beneficial |
| 5 - 11 | Moderately beneficial |
| 3 – 4 | Slightly beneficial |
| 0 – 2 | Beneficial |

1. **Significance analysis: Alternative 1 (preffered corridor 1) PREFERRED ACTIVITY: PROPOSED AGGENEIS-PAULPUTS 400kV TRANSMISSION POWERLINE AND SUBSTATIONS UPGRADE, DEA REF: 14/12/16/3/3/2/1012**

***Without = Without Mitigation***

***With = With Mitigation***

**Table 2.1 Analysis of the significance of potential biodiversity and ecological process impacts**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **NEGATIVE IMPACTS / EFFECTS** | | | | | | | | | | | | | | |
|  | **Activity** | **Nature of potential impact** | **Spatial extent** | | **Severity / intensity / magnitude** | | **Duration** | | **Resource loss** | **Reversibility** | | **Probability** | | **Significance scoring without mitigation** | **Significance scoring with mitigation** |
| **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** |
| **Planning Phase** |  | **No significant impacts anticipated** | | | | | | | | | | | | | |
| **Construction Phase** | Clearance of Vegetation | Clearing of vegetation for tower erection – Loss of flora | 2 | 1 | 4 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | **9** | **6** |
| Clearing of vegetation for access roads – Loss of flora | 3 | 1 | 4 | 3 | 7 | 3 | 3 | 3 | 1 | 1 | 1 | **20** | **11** |
| Destruction of plants of conservation concern – construction of activity where these plants potentially occur | 3 | 1 | 6 | 4 | 7 | 3 | 5 | 7 | 1 | 0.9 | 0.6 | **25.2** | **8.4** |
| Disturbance to vegetation in drainage lines | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0.6 | 0.2 | **4.2** | **1** |
| Soil Erosion | Exposure of the soil to erosion, destruction of soil crust | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 1 | 0.6 | 0.2 | **7.8** | **1.4** |
| Soil Compaction | The movement of heavy vehicles / machinery may compact soil and inhibit re-vegetation – particularly quartz fields | 3 | 1 | 7 | 2 | 7 | 1 | 5 | 7 | 7 | 0.8 | 0.3 | **23.2** | **4.8** |
| Pollutants/waste | Materials and substances allowed to remain and impact on fauna | 2 | 1 | 2 | 1 | 3 | 1 | 1 | 3 | 1 | 0.3 | 0.1 | **2.7** | **0.5** |
| Disturbance and loss of Faunal Habitat | Fauna habitat within and immediately adjacent to the construction footprint will be disturbed and some loss will occur | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0.1 | 0.0 | **0.6** | **0** |
| Potential increase of invasive vegetation | Contaminated construction vehicles and tools can spread alien invasive species into disturbed soils, and  alien invasive species spread from current infestation into disturbed soils | 2 | 1 | 4 | 1 | 1 | 1 | 1 | 3 | 1 | 0.3 | 0.1 | **3.3** | **0.5** |
| General construction activities, earth works, including clearance of vegetation | Destruction of bird habitat | 1 | 1 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 1.0 | 1.0 | **14** | **14** |
| Disturbance of birds | 3 | 3 | 5 | 3 | 1 | 1 | 2 | 1 | 1 | 0.7 | 0.2 | **8.4** | **2.0** |
| Human and construction related disturbance – Increased risk of animal strikes due to increase volumes of construction vehicles and workers | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0.1 | 0.1 | **0.6** | **0.5** |
| **Operational Phase** | Operation of power line | Collision of Birds with earth wires | 4 | 4 | 6 | 4 | 3 | 3 | 5 | 3 | 3 | 0.7 | 0.2 | **14.7** | **3.8** |
| Electrical faulting caused by birds – **impact on business not birds** | 4 | 4 | 5 | 3 | 3 | 3 | 1 | 1 | 1 | 0.4 | 0.1 | **5.6** | **1.2** |
| Disturbance of natural vegetation | Maintenance vehicles driving within natural vegetation / quartz fields | 3 | 1 | 5 | 2 | 3 | 1 | 4 | 3 | 1 | 0.3 | 0.2 | **5.4** | **1.8** |
| Erosion | Lack of failed rehabilitation | 2 | 1 | 3 | 1 | 3 | 1 | 3 | 3 | 1 | 0.4 | 0.2 | **5.6** | **1.4** |
| Possible invasion by exotic vegetation | Alien vegetation spreading into disturbed soil, especially in the absence of successful rehabilitation | 2 | 1 | 4 | 1 | 3 | 1 | 3 | 1 | 1 | 0.3 | 0.1 | **3.9** | **0.7** |
|  | **POSITIVE IMPACTS / EFFECTS** | | | | | | | | | | | | | | |
| **Construction and Operational Phase** | **Activity** | **Nature of impact** | | **Spatial extent** | | **Severity / intensity / magnitude** | | **Duration** | | | | **Probability** | | **Significance scoring** | |
| Removal of Invasive plants | Removal of existing invasive alien vegetation in areas proposed for development and within servitudes | | 2 | | 3 | | 3 | | | | 0.5 | | **4** | |
| **Operational Phase** | Operation of power line | Nesting of birds on pylons/towers | | 3 | | 5 | | 3 | | | | 0.6 | | **6.6** | |

**Summary of significance scoring**

Activities that would cause marginal impact to the environment include:

* The clearance of vegetation for access roads or upgrade of existing roads;
* Clearing of vegetation for the tower footprint, construction camps and where structures are stored within natural veld;
* Disturbances to vegetation within drainage lines;
* Potential destruction or damage to threatened, endemic and protected plant species;
* The movement of heavy vehicles that may compact the soil and inhibit re-vegetation, particularly on quartz fields;
* The disturbance of natural vegetation during maintenance of the powerline, particularly on quartz fields; and
* Erosion and invasion of disturbed areas due to a lack of or failed rehabilitation.

Within the grasslands, particularly the gravelly grassland, calcrete and quartz patches are found and are localised, high sensitivities that must be investigated during a walk-down and spanned by any construction and related activities.

Within Corridor 1 and along the existing access roads, new roads or expansion of existing disturbed footprint will have a negative impact on the quartz fields.

Nonetheless, the significance would be less significant if the the proposed 400kV powerline are routed alongside the existing 220kV powerline and may be rendered acceptable in light of the proposed mitigations.

**Table 2.2 Analysis of the significance of cumulative biodiversity and ecological process impacts**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **CUMULATIVE IMPACTS / EFFECTS FOR CORRIDORS 1,2,3, 3A** | | | | | | | | | | | | | | |
|  | **Activity** | **Nature of potential impact** | **Spatial extent** | | **Severity / intensity / magnitude** | | **Duration** | | **Resource loss** | **Reversibility** | | **Probability** | | **Significance scoring without mitigation** | **Significance scoring with mitigation** |
| **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** |
| **Planning Phase** |  | **No significant impacts anticipated** | | | | | | | | | | | | | |
| **Construction Phase** | Clearance of Vegetation | Clearing of vegetation can and will influence runoff and water flow patterns and dynamics, which could cause excessive accelerated erosion | 4 | 2 | 4 | 3 | 3 | 1 | 4 | 7 | 3 | 0.8 | 0.4 | **17.6** | **5.2** |
| Possible increase in fragmentation | 4 | 2 | 4 | 3 | 3 | 2 | 4 | 3 | 1 | 0.6 | 0.3 | **9.6** | **3.6** |
| Possible erosion of areas lower than the access road and camps, possible contamination of water resources due to hydrocarbon or other spillage | 3 | 2 | 4 | 2 | 3 | 1 | 4 | 1 | 1 | 0.6 | 0.2 | **9** | **2.4** |
| **Operational Phase** | Maintenance and operational activities | Spread of alien invasive species | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 1 | 0.3 | 0.1 | **3.9** | **0.7** |
| Increased erosion within the greater area due to access roads, operational activities of powerlines and plants in the area | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 1 | 0.6 | 0.2 | **7.8** | **1.4** |
| Gradually unjustified increase in footprint area | 4 | 1 | 4 | 2 | 3 | 1 | 4 | 3 | 1 | 0.7 | 0.2 | **12.6** | **1.8** |
| Contamination of soils and possibly ground water | 3 | 1 | 5 | 2 | 3 | 1 | 5 | 7 | 1 | 0.3 | 0.2 | **6.6** | **2** |
|  | Cumulative impacts on birds | Cumulative impacts of multiple projects on birds. The extent would be up to 30km radius. | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1 | 1 | 0.2 | 0.1 | **2.2** | **0.8** |

The majority of the study area comprise natural vegetation with minimum transformation and land uses along the powerline routes. Route alternative 1 and 2 follow existing powerlines, servitudes and access roads for most of its extent and will therefore likely result in the least increase in transformed areas.

The large solar plant at Paulputs substation, the proposed wind farms around Aggeneis and the proposed 400kV powerline between Paulputs and Aggeneis will disturbed and modify vegetation and habitat. In addition, these developments will also cause edge effects into adjacent natural vegetation, which cumulatively will increase the transformed or impacted areas and increase fragmentation.

The amount of servitudes should thus be kept to a minimum, with lines rather running parallel in a wider servitude where feasible, with only one maintenance track necessary in such servitude, rather than each project having a distinct servitude for most of the line route.

In terms of the cumulative impacts of multiple projects on birds: It is recommended that each project within this broader area ensures that no effort is spared in mitigating impacts on avifauna. It is hoped that if each project provides sufficient mitigation, the overall cumulative impact can be reduced.

**Table 2.3 Analysis of the significance of potential water-related impacts**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **NEGATIVE IMPACTS / EFFECTS** | | | | | | | | | | | | | | |
|  | **Activity** | **Nature of impact** | **Spatial extent** | | **Severity / intensity / magnitude** | | **Duration** | | **Resource loss** | **Reversibility** | | **Probability** | | **Significance scoring without mitigation** | **Significance scoring with mitigation** |
| **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** |
| **Planning Phase** | **No significant impacts anticipated** | | | | | | | | | | | | | | |
| **Construction Phase** | Driving through watercourses | Compaction of watercourse soils | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 0.5 | 0.2 | **6.8** | **2.2** |
| Infrastructure construction | Flow changes, increased sedimentation and erosion in watercourses | 1 | 1 | 4 | 3 | 4 | 2 | 4 | 4 | 2 | 0.5 | 0.2 | **8.8** | **2.4** |
| Infrastructure construction | Loss of watercourse habitat | 1 | 1 | 4 | 3 | 4 | 2 | 5 | 4 | 3 | 0.5 | 0.2 | **9.3** | **2.8** |
| Refuelling and storage of materials | Contamination of water resources | 2 | 1 | 5 | 2 | 3 | 2 | 3 | 3 | 1 | 0.8 | 0.2 | **11.8** | **1.8** |
| Soil disturbances and vegetation clearing | Encroachment of alien species into watercourses | 2 | 1 | 4 | 2 | 6 | 1 | 4 | 3 | 1 | 0.7 | 0.2 | **13.8** | **1.8** |
| **Operational Phase** | Vehicles driving in / through watercourses | Compaction of watercourse soils | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 0.5 | 0.2 | **6.8** | **2.2** |
| Soil disturbances and vegetation clearing | Contamination of water resources | 2 | 1 | 4 | 2 | 6 | 1 | 3 | 3 | 1 | 0.5 | 0.2 | **9.3** | **1.6** |

**Summary of significance scoring**

Activities that would cause marginal impact to the environment include:

* Increased erosion and off site sedimentation due to vegetation clearance;
* Changing the quantity and fluctuation properties of the watercourses due to vehicles driving through watercourses during construction and operational phases; and
* Refuelling and storage of materials, if not mitigated, causing contamination of water resources during construction and operational phases.

Fortunately, the significance of the above impacts are slight due to the proposed 400kV powerline being alongside the existing 220kV powerline and may be rendered acceptable in light of the proposed mitigations.

**Table 2.4 Analysis of the significance of cumulative water-related impacts**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **CUMULATIVE IMPACTS / EFFECTS FOR CORRIDORS 1,2,3, 3A** | | | | | | | | | | | | | | |
|  | **Activity** | **Nature of potential impact** | **Spatial extent** | | **Severity / intensity / magnitude** | | **Duration** | | **Resource loss** | **Reversibility** | | **Probability** | | **Significance scoring without mitigation** | **Significance scoring with mitigation** |
| **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** |
| **Planning Phase** |  | **No significant impacts anticipated** | | | | | | | | | | | | | |
| **Construction Phase** | Infrastructure construction | Flow changes, increased sedimentation and erosion in watercourses | 1 | 1 | 6 | 3 | 4 | 2 | 4 | 5 | 3 | 0.8 | 0.4 | 16.6 | 5.4 |
| Infrastructure construction | Loss of watercourse habitat | 1 | 1 | 5 | 3 | 4 | 3 | 5 | 5 | 3 | 0.8 | 0.4 | 16.6 | 6.2 |
| **Operational Phase** | Driving through watercourses | Compaction of watercourse soils | 2 | 1 | 4 | 3 | 4 | 3 | 3 | 4 | 3 | 1 | 0.4 | 18.0 | 5.4 |
| Soil disturbances and vegetation clearing | Encroachment of alien species into watercourses | 2 | 1 | 4 | 2 | 4 | 2 | 3 | 3 | 2 | 0.8 | 0.5 | 13.4 | 5.3 |

# Table 2.5 Analysis of the significance of potential social and socio-economic impacts

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **NEGATIVE IMPACTS / EFFECTS** | | | | | | | | | | | | | | | | |
|  | **Activity** | | **Nature of impact** | **Spatial extent** | | | **Severity / intensity / magnitude** | | **Duration** | | **Resource loss** | **Reversibility** | | **Probability** | | **Significance scoring without mitigation** | **Significance scoring with mitigation** |
| **Without** | **With** | | **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** |
| **Planning Phase** | Planning activities. | | Social anxiety in respect of concerned IAPs | 2 | 1 | | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0.2 | 0.1 | **1.4** | **0.5** |
| **Construction Phase** | General construction activities. | | Social anxiety in respect of concerned IAPs | 2 | 1 | | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0.2 | 0.1 | **1.4** | **0.5** |
| Disruption and inconvenience to property owners | 2 | 1 | | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 0.2 | 0.1 | **1.8** | **0.7** |
| **Operational Phase** | Powerline proximate to residential property. | | Property values are impacted negatively due to the visual pollution caused by the presence of the towers | 2 | 1 | | 5 | 4 | 3 | 3 | 4 | 3 | 1 | 0.3 | 0.2 | **5.1** | **2.6** |
|  | **POSITIVE IMPACTS / EFFECTS** | | | | | | | | | | | | | | | | |
|  | **Activity** | **Nature of impact** | | | | **Spatial extent** | | **Severity / intensity / magnitude** | | **Duration** | | | | **Probability** | | **Significance scoring** | |
| **Construction Phase** | General construction activities. | Temporary job opportunities and skills development for local communities | | | | 2 | | 4 | | 1 | | | | 0.6 | | **4.2** | |
| **Operational phase** | Operation of the 400kV Powerline and substations upgrades | Promotion of economic growth in the area for both IPPs and towns, through improved services and infrastructure | | | | 6 | | 7 | | 7 | | | | 0.8 | | **16** | |
| Job creation through increased economic growth in the area | | | | 4 | | 5 | | 3 | | | | 0.8 | | **9.6** | |

**Summary of significance scoring**

The powerline proximate to residential properties would negatively impact on the property values due to the visual pollution caused by the presence of the towers. The significance of the impact would be minor due to the proposed 400kV powerline being alongside the existing 220kV powerline and may be rendered acceptable in light of the proposed mitigations.

**Table 2.6 Analysis of the significance of potential aesthetic / sense of place impacts**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **NEGATIVE IMPACTS / EFFECTS** | | | | | | | | | | | | | | |
|  | **Activity** | **Nature of impact** | **Spatial extent** | | **Severity / intensity / magnitude** | | **Duration** | | **Resource loss** | **Reversibility** | | ***P*** | | **Significance scoring without mitigation** | **Significance scoring with mitigation** |
| **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** |
| **Planning**  **Phase** | **No significant impacts anticipated** | | | | | | | | | | | | | | |
| **Construction Phase** | Construction related activities for example foundation preparation, tower erection and conductor stringing | **Observers:** Visual intrusion caused by construction activity and the presence of workforce and construction equipment that is unfamiliar to the status quo. | 2 | 2 | 4 | 3 | 3 | 1 | 1 | 3 | 1 | 0.8 | 0.6 | **10.4** | **4.8** |
| **Visual resource**: Negative impact on the sense of place and prevailing character due to the presence of machinery, material and workforce that is uncharacteristic to the visual resource. | 2 | 2 | 5 | 4 | 3 | 1 | 2 | 3 | 1 | 0.6 | 0.6 | **9.0** | **6.0** |
| **Operational Phase** | The presence of a new powerline | **Observers:** A new transmission line will be added to the baseline environment and will interfere with panoramic views and open vistas. It will intrude on the observer's visual experience. | 4 | 4 | 4 | 4 | 7 | 7 | 2 | 7 | 3 | 0.7 | 0.7 | **16.8** | **14.0** |
| **Visual resource**: A new transmission line will be a prominent addition to the baseline environment. The complex industrial character and enormous scale of the towers will contrast with the predominantly flat topography, desolate sense of place and natural landscape. It will negatively impact on the scenic quality of the visual resource. | 4 | 4 | 5 | 4 | 7 | 7 | 3 | 7 | 3 | 0.8 | 0.8 | **20.8** | **16.8** |

**Summary of significance scoring**

The potential aesthetic and sense of place impacts would be temporary during the construction phase. A new powerline is considered to have a substantial impact on the scenic quality of the visual resource. Due to the proposed 400kV powerline being alongside the existing 220kV powerline, mitigation may minimise the impact.

**Table 2.7 Analysis of the significance of potential aesthetic / sense of place impacts on Substation Upgrades**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **NEGATIVE IMPACTS / EFFECTS – SUBSTATION UPGRADES** | | | | | | | | | | | | | | |
|  | **Activity** | **Nature of impact** | **Spatial extent** | | **Severity / intensity / magnitude** | | **Duration** | | **Resource loss** | **Reversibility** | | ***P*** | | **Significance scoring without mitigation** | **Significance scoring with mitigation** |
| **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** |
| **Planning**  **Phase** | **No significant impacts anticipated** | | | | | | | | | | | | | | |
| **Construction Phase** | Construction related activities for example base preparation, construction and commissioning | **Observers:** Visual intrusion caused by construction activity and the presence of workforce and construction equipment that is unfamiliar to the status quo. | 2 | 2 | 4 | 3 | 3 | 1 | 2 | 3 | 1 | 0.2 | 0.2 | **2.80** | **1.80** |
| **Visual resource**: Negative impact on the sense of place and prevailing character due to the presence of machinery, material and workforce that is uncharacteristic to the visual resource. | 3 | 3 | 4 | 3 | 3 | 1 | 2 | 3 | 1 | 0.2 | 0.2 | **3.00** | **2.00** |
| **Operational Phase** | The presence of larger substations. | **Observers:** The existing substations will experience an increase footprint size that will cause a noticeable visual change. This will result in a visual intrusion on the few observers in the proximity to the substations. | 2 | 2 | 3 | 3 | 7 | 7 | 2 | 7 | 3 | 0.2 | 0.2 | **4.2** | **3.4** |
| **Visual resource**: The upgrades to the substations is considered relatively small additions to the visual resource and will change the baseline environment on a site scale. No major impacts on the prevailing character is expected. | 3 | 3 | 4 | 4 | 7 | 7 | 2 | 7 | 3 | 0.1 | 0.1 | **2.3** | **1.9** |

**Table 2.8 Analysis of the significance of potential heritage and cultural impacts**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **NEGATIVE IMPACTS / EFFECTS** | | | | | | | | | | | | | | |
|  | **Activity** | **Nature of potential impact** | **Spatial extent** | | **Severity / intensity / magnitude** | | **Duration** | | **Resource loss** | **Reversibility** | | **Probability** | | **Significance scoring without mitigation** | **Significance scoring with mitigation** |
| **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** | **Without** | **With** |
| **Planning Phase** |  | **No significant impacts anticipated** | | | | | | | | | | | | | |
| **Construction Phase** | Construction on heritage sites including disturbance of land surfaces and subsurface features | Disturbance of graves/cemeteries | 1 | 1 | 4 | 1 | 7 | 1 | 4 | 7 | 1 | 0.1 | 0 | **2.3** | **0** |
| Disturbance of archaeological heritage resources (this assessment does not evaluate palaeontological resources) | 1 | 1 | 4 | 1 | 7 | 1 | 4 | 7 | 1 | 0.2 | 0.1 | **4.6** | **0.8** |
| General Construction Activities | Human and construction related disturbance of surfaces or heritage features beyond the immediate footprint of the development | 1 | 1 | 4 | 1 | 7 | 1 | 4 | 7 | 1 | 0.2 | 0.1 | **4.6** | **0.8** |
| **Operational Phase** | Disturbance of heritage resources beyond the immediate footprint of the development | Maintenance vehicles driving or other surface-disturbing activity beyond the immediate footprint of the development. | 1 | 1 | 4 | 1 | 7 | 1 | 4 | 7 | 1 | 0.2 | 0.1 | **4.6** | **0.8** |
|  | **POSITIVE IMPACTS / EFFECTS** | | | | | | | | | | | | | | |
| **Construction and Phase** | **Activity** | **Nature of impact** | | **Spatial extent** | | **Severity / intensity / magnitude** | | **Duration** | | | | **Probability** | | **Significance scoring** | |
| Disturbance of surfaces and sub-surfaces revealing unsuspected heritage resources to be mitigated | Identification of heritage resources for salvage (mitigation) leading to new knowledge production | | 1 | | 3 | | 7 | | | | 0.2 | | **2.2** | |

**Summary of significance scoring**

Activities that would cause marginal impact to the environment include:

* Disturbance of land surfaces that potentially contain (surface or sub-surface) heritage resources – artefacts, graves, features.
* The disturbance of surfaces beyond the immediate footprint during maintenance.

However, the significance would be inconsequential due to the proposed 400kV powerline being alongside the existing 220kV powerline and may be rendered acceptable in light of the proposed mitigations.

1. **Source:** adapted from Glasson J, Therivel R & Chadwick A. Introduction to Environmental Impact Assessment, 2nd Edition. 1999. pp 258. Spon Press, United Kingdom. [↑](#footnote-ref-1)
2. **Source:** adapted from Glasson J, Therivel R & Chadwick A. Introduction to Environmental Impact Assessment, 2nd Edition. 1999. pp 258. Spon Press, United Kingdom. [↑](#footnote-ref-2)