

## TABLE OF CONTENTS

	<b>PAGE</b>
<b>1. INTRODUCTION</b>	<b>1</b>
1.1. The Need and Justification for the Proposed Project	1
1.2 Overview of the Proposed Project	4
1.3 Environmental Study Requirements	6
<b>2. DESCRIPTION OF THE PROPOSED PROJECT</b>	<b>7</b>
2.1. The Proposed CSP Plant	7
2.2.1. <i>How is Electricity Generated at a CSP Plant</i>	8
2.2. Project Alternatives	10
2.2.1. <i>Technology Alternatives</i>	11
2.2.2 <i>The 'Do Nothing Alternative'</i>	12
2.3. Location Alternatives for the Establishment of a New Concentrating Solar Power plant within South Africa	13
2.4. Site alternatives Identified within the Northern Cape Province for the Establishment of a New Concentrating Solar Power Plant	14
2.4.1. <i>Description of Identified Site alternatives</i>	14
2.5. Associated Infrastructure	18
<b>3. SCOPE OF ENVIRONMENTAL INVESTIGATIONS</b>	<b>20</b>
3.1. Approach to Undertaking the Study	20
3.1.1. <i>Environmental Scoping Process</i>	21
3.2. Authority Consultation	21
3.2.1. <i>Consultation with Supervisory Authorities</i>	21
3.2.2. <i>Consultation with other Relevant Authorities</i>	22
3.3. Environmental Impact Assessment	23
3.3.1. <i>Specialist Studies</i>	23
3.3.2. <i>Overview of the Public Participation Process</i>	24
3.3.3. <i>Public Review of the Draft Environmental Impact Report</i>	28
3.3.4. <i>Final Environmental Impact Report</i>	28
<b>4. LEGAL DISCUSSION</b>	<b>29</b>
4.1. Content of this report and how it differs from the first report	29
4.1.1. <i>The general Content of the first report</i>	29
4.1.2 <i>The general content of this report</i>	40
4.2. Scope and Limitations of this report	40
4.2.1. <i>The amended NEMA EIA Regime</i>	40
4.2.2. <i>Applicable convention, legislation and by laws</i>	41
4.3. Conclusion	44

<b>5.</b>	<b>SITE SELECTION PROCESS UNDERTAKEN DURING THE ENVIRONMENTAL SCOPING STUDY</b>	<b>45</b>
<b>5.1.</b>	<b>Site Evaluation- Field Studies</b>	<b>45</b>
<b>5.2.</b>	<b>Specialist Studies</b>	<b>46</b>
<b>5.3.</b>	<b>Rating Criteria</b>	<b>49</b>
<b>5.4.</b>	<b>Sensitivity Mapping and Footprint Analysis</b>	<b>53</b>
<b>5.5.</b>	<b>Overall Conclusion and Recommendations</b>	<b>56</b>
<b>6.</b>	<b>APPROACH TO ENVIRONMENTAL IMPACT ASSESSMENT</b>	<b>57</b>
<b>6.1.</b>	<b>Specialist Studies</b>	<b>57</b>
<b>6.2.</b>	<b>Significance Ratings</b>	<b>58</b>
<b>6.2.1.</b>	<i>Temporal Scale</i>	<b>59</b>
<b>6.2.2.</b>	<i>Spatial Scale</i>	<b>59</b>
<b>6.2.3.</b>	<i>Severity / Beneficial Rating Scale</i>	<b>59</b>
<b>6.2.4.</b>	<i>Significance Scale</i>	<b>60</b>
<b>6.2.5.</b>	<i>Risk or Likelihood</i>	<b>63</b>
<b>6.2.6.</b>	<i>Degree of confidence or certainty</i>	<b>63</b>
<b>6.3.</b>	<b>Assumptions and limitations</b>	<b>64</b>
<b>7.</b>	<b>GENERAL DESCRIPTION OF THE STUDY AREA ENVIRONMENT</b>	<b>65</b>
<b>7.1</b>	<b>Locality</b>	<b>65</b>
<b>7.2.</b>	<b>Climate</b>	<b>65</b>
<b>7.3.</b>	<b>Topography and Landscape</b>	<b>67</b>
<b>7.4.</b>	<b>Geology and Soils</b>	<b>67</b>
<b>7.5.</b>	<b>Land use and agricultural Potential</b>	<b>68</b>
<b>7.6.</b>	<b>Conservation Areas</b>	<b>68</b>
<b>7.7.</b>	<b>Water Resources</b>	<b>69</b>
<b>7.7.1.</b>	<i>Surface Water</i>	<b>69</b>
<b>7.7.2.</b>	<i>Ground Water</i>	<b>69</b>
<b>7.8.</b>	<b>Ecology and Biodiversity</b>	<b>69</b>
<b>7.8.1.</b>	<i>Olifantshoek Plains Thornveld (Savanna).</i>	<b>69</b>
<b>7.8.2</b>	<i>Kalahari Karroid shrubland (Nama- Karoo).</i>	<b>70</b>
<b>7.9.</b>	<b>Social Environment</b>	<b>71</b>
<b>7.9.1.</b>	<i>Land use</i>	<b>72</b>
<b>7.9.2</b>	<i>Population</i>	<b>72</b>
<b>7.9.3</b>	<i>Age and Gender Distribution</i>	<b>72</b>
<b>7.9.4</b>	<i>Education</i>	<b>73</b>
<b>7.9.5</b>	<i>Employment</i>	<b>73</b>
<b>7.9.6</b>	<i>Income</i>	<b>75</b>
<b>7.9.7</b>	<i>Housing</i>	<b>75</b>
<b>7.9.8.</b>	<i>Services</i>	<b>76</b>

<b>8.</b>	<b>SURFACE WATER ASSESSMENT</b>	78
<b>8.1</b>	<b>Introduction</b>	78
<b>8.2.</b>	<b>Environmental Description</b>	79
<b>8.2.1.</b>	<b><i>Site Description</i></b>	79
<b>8.2.2.</b>	<b><i>Climate and Landscape</i></b>	80
<b>8.3.</b>	<b>Methods</b>	81
<b>8.3.1.</b>	<b><i>Criteria used to Rank Impacts</i></b>	81
<b>8.4.</b>	<b>Water Requirements of the CSP</b>	81
<b>8.5.</b>	<b>Flow in the Orange River</b>	81
<b>8.6.</b>	<b>Assessment</b>	83
<b>8.7.</b>	<b>Conclusions</b>	84
<b>9.</b>	<b>GROUNDWATER IMPACT ASSESSMENT</b>	86
<b>9.1.</b>	<b>Introduction</b>	86
<b>9.2.</b>	<b>Topography and Geology</b>	87
<b>9.3.</b>	<b>Hydrogeology</b>	88
<b>9.4.</b>	<b>Groundwater Chemistry</b>	89
<b>9.5.</b>	<b>Significance Rating Scales</b>	90
<b>9.6.</b>	<b>Conclusions and Recommendations</b>	92
<b>10.</b>	<b>VEGETATION AND TERRESTRIAL ASSESSMENT</b>	93
<b>10.1.</b>	<b>Introduction</b>	93
<b>10.2.</b>	<b>Scope and Limitations</b>	93
<b>10.2.1.</b>	<b><i>Vegetation</i></b>	93
<b>10.2.2.</b>	<b><i>Terrestrial Fauna</i></b>	94
<b>10.2.3.</b>	<b><i>Ecology</i></b>	94
<b>10.2.4.</b>	<b><i>Assumptions</i></b>	94
<b>10.2.5.</b>	<b><i>Limitations</i></b>	94
<b>10.3.</b>	<b>Methodology</b>	94
<b>10.3.1.</b>	<b><i>Information base (sources) for desk study</i></b>	94
<b>10.3.2.</b>	<b><i>Survey</i></b>	95
<b>10.3.3.</b>	<b><i>Habitat Assessment</i></b>	95
<b>10.4.</b>	<b>Regional Overview</b>	97
<b>10.4.1.</b>	<b><i>Major plant communities</i></b>	97
<b>10.5.</b>	<b>Site Specific Results</b>	98
<b>10.5.1.</b>	<b><i>Olyvenhouts Drift</i></b>	98
<b>10.6.</b>	<b>Conclusions</b>	99
<b>10.7.</b>	<b>Recommendations</b>	100
<b>11.</b>	<b>AVIFAUNA</b>	101
<b>11.1.</b>	<b>Introduction</b>	101
<b>11.1.1.</b>	<b><i>Background to the CSP Project</i></b>	101
<b>11.1.2.</b>	<b><i>Review of potential avifaunal issues</i></b>	101
<b>11.2.</b>	<b>Scope and limitations</b>	105

<b>11.3.</b>	<b>Methodology</b>	106
<b>11.3.1.</b>	<b><i>Ranking of the three sites during the scoping phase</i></b>	106
<b>11.3.2.</b>	<b><i>Site Preference Rating (SPR)</i></b>	108
<b>11.4.</b>	<b>Regional Overview</b>	108
<b>11.5</b>	<b>Site specific Assessment of the Impacts</b>	111
<b>11.6.</b>	<b>Conclusions</b>	117
<b>12.</b>	<b>VISUAL IMPACT ASSESSMENT</b>	119
<b>12.1.</b>	<b>Introduction</b>	119
<b>12.2.</b>	<b>Scope of Work</b>	119
<b>12.3.</b>	<b>Methodology for the Assessment of the Visual Impact</b>	120
<b>12.3.1.</b>	<b><i>General</i></b>	120
<b>12.3.2.</b>	<b><i>Potential Visual Exposure</i></b>	120
<b>12.3.3.</b>	<b><i>Visual Distance / Observer Proximity to the Facility</i></b>	122
<b>12.3.4.</b>	<b><i>Viewer Incidence / Viewer Perception</i></b>	123
<b>12.3.5.</b>	<b>Visual Absorption Capacity of the natural vegetation</b>	124
<b>12.3.6.</b>	<b><i>Visual Impact Index</i></b>	124
<b>12.4.</b>	<b>Regional Overview</b>	125
<b>12.4.1.</b>	<b><i>Description of the Affected Environment</i></b>	125
<b>12.4.2.</b>	<b><i>Site Description</i></b>	126
<b>12.5.</b>	<b><i>Site Specific Results</i></b>	126
<b>12.5.1.</b>	<b><i>Visual Impact Index</i></b>	126
<b>12.5.2.</b>	<b><i>Issues related to the visual impact of the CSP Plant</i></b>	128
<b>12.6.</b>	<b>Conclusions and Recommendations</b>	133
<b>13.</b>	<b>NOISE IMPACT ASSESSMENT</b>	135
<b>13.1</b>	<b>Introduction</b>	135
<b>13.1.1</b>	<b><i>General</i></b>	135
<b>13.1.2.</b>	<b><i>Terms of reference</i></b>	135
<b>13.1.3.</b>	<b><i>Location and Extent of the Study Area</i></b>	135
<b>13.2.</b>	<b>Details of the planned CSP Plant</b>	137
<b>13.3</b>	<b>Methodology</b>	137
<b>13.3.1.</b>	<b><i>Determination of the Existing Conditions</i></b>	138
<b>13.3.2.</b>	<b><i>Assessment of Planning/Design Phase and Construction Phase Impacts</i></b>	139
<b>13.3.3</b>	<b><i>Assessment of Operational Phase impacts</i></b>	139
<b>13.4.</b>	<b>Details of the Study Area</b>	139
<b>13.4.1</b>	<b><i>Topography</i></b>	139
<b>13.4.2.</b>	<b><i>Land Use</i></b>	139
<b>13.4.3.</b>	<b><i>Roads</i></b>	140
<b>13.4.4</b>	<b><i>Railway Lines</i></b>	141
<b>13.4.5.</b>	<b><i>Factors of Acoustical Significance</i></b>	141
<b>13.5.</b>	<b>Findings and Assessment of Impact</b>	141
<b>13.5.1.</b>	<b><i>Noise Sources</i></b>	141

<b>13.5.2.</b>	<b><i>Noise Sensitive Areas/sites</i></b>	141
<b>13.5.3.</b>	<b><i>The Residual (Existing) Noise Climate</i></b>	142
<b>13.5.4.</b>	<b><i>The Predicted Noise Climate (Pre-Construction Phase)</i></b>	142
<b>13.5.5.</b>	<b><i>The Predicted Noise Climate (Construction Phase)</i></b>	142
<b>13.5.6.</b>	<b><i>The Predicted Noise Climate (Operational Phase)</i></b>	143
<b>13.5.7.</b>	<b><i>Significance Rating of the Noise Impact</i></b>	146
<b>13.6.</b>	<b><i>Conclusions</i></b>	147
<b>13.7.</b>	<b><i>Mitigation Measures</i></b>	147
<b>13.7.1.</b>	<b><i>Pre-Construction Phase</i></b>	147
<b>13.7.2.</b>	<b><i>Construction Phase</i></b>	147
<b>13.7.3.</b>	<b><i>Operational Phase</i></b>	148
<b>13.8.</b>	<b><i>Recommendations</i></b>	148
<b>14.</b>	<b><i>SOCIAL IMPACT ASSESSMENT</i></b>	150
<b>14.1.</b>	<b><i>Introduction</i></b>	150
<b>14.1.1.</b>	<b><i>Background to the Proposed Project</i></b>	150
<b>14.1.2.</b>	<b><i>Definition of a Social Impact Assessment</i></b>	150
<b>14.1.3.</b>	<b><i>Purpose of the Report</i></b>	151
<b>14.1.4.</b>	<b><i>Scope</i></b>	151
<b>14.1.5.</b>	<b><i>Methodology</i></b>	151
<b>14.1.6.</b>	<b><i>Assessment Categories</i></b>	152
<b>14.1.7.</b>	<b><i>Impact Tables</i></b>	155
<b>14.2.</b>	<b><i>Proposed Sites</i></b>	155
<b>14.2.1.</b>	<b><i>Alternative Sites</i></b>	155
<b>14.2.2.</b>	<b><i>Preferred Site – Olyvenhouts Drift</i></b>	155
<b>14.3.</b>	<b><i>Key Demographic Information</i></b>	158
<b>14.3.1.</b>	<b><i>Demographics</i></b>	158
<b>14.3.2.</b>	<b><i>Key Economic Activities in the Region</i></b>	159
<b>14.3.3.</b>	<b><i>Employment and Income</i></b>	160
<b>14.3.4.</b>	<b><i>Housing and Services</i></b>	163
<b>14.3.5.</b>	<b><i>Land Use Profile</i></b>	164
<b>14.4.</b>	<b><i>Social Impact Assessment</i></b>	167
<b>14.4.1.</b>	<b><i>Population Impacts</i></b>	167
<b>14.4.2.</b>	<b><i>Community/Institutional Arrangements</i></b>	172
<b>14.4.3.</b>	<b><i>Individual, Community and Family Level Impacts</i></b>	176
<b>14.4.4.</b>	<b><i>Socio-economic Impacts</i></b>	181
<b>14.4.5.</b>	<b><i>Intrusion Impacts</i></b>	187
<b>14.5.</b>	<b><i>Conclusions and Recommendations</i></b>	189
<b>14.5.1.</b>	<b><i>Preliminary Conclusions</i></b>	189
<b>14.5.2.</b>	<b><i>Preliminary Recommendations</i></b>	191
<b>15.</b>	<b><i>CONCLUSIONS AND RECOMMENDATIONS</i></b>	192
<b>15.1.</b>	<b><i>Evaluation of the Proposed Project</i></b>	192
<b>15.2.</b>	<b><i>Final Conclusions of the Specialist studies</i></b>	194

<b>15.2.1.</b>	<b><i>Surface Water</i></b>	194
<b>15.2.2.</b>	<b><i>Ground Water</i></b>	195
<b>15.2.3.</b>	<b><i>Ecology</i></b>	195
<b>15.2.4.</b>	<b><i>Avifauna</i></b>	195
<b>15.2.5.</b>	<b><i>Visual</i></b>	196
<b>15.2.6.</b>	<b><i>Noise</i></b>	197
<b>15.2.7.</b>	<b><i>Social</i></b>	197
<b>15.3.</b>	<b>Recommendations for Appropriate Mitigation Measures</b>	199
<b>15.3.1.</b>	<b><i>Ground Water</i></b>	199
<b>15.3.2.</b>	<b><i>Fauna and Flora</i></b>	199
<b>15.3.3.</b>	<b><i>Avifauna</i></b>	200
<b>15.3.4.</b>	<b><i>Visual/Aesthetic Impacts</i></b>	201
<b>15.3.5.</b>	<b><i>Noise Impacts</i></b>	201
<b>15.3.6.</b>	<b><i>Social Impacts</i></b>	202
<b>15.4.</b>	<b><i>Summary of Significance Ratings</i></b>	204
<b>15.5.</b>	<b><i>Overall Conclusions</i></b>	210
<b>15.6.</b>	<b><i>Overall Recommendations</i></b>	210
<b>16.</b>	<b>REFERENCES</b>	211

#### **APPENDICES:**

<b>Appendix A:</b>	Acceptance of Environmental Scoping Report and Plan of Study for EIA
<b>Appendix B:</b>	Advertisements
<b>Appendix C:</b>	Issues Trail and Comments and I&AP Database
<b>Appendix D:</b>	Legal Discussion – Table 1A
<b>Appendix E:</b>	Legal Discussion – Table 2
<b>Appendix F:</b>	Legal Discussion – Table 2 A and Annexure
<b>Appendix G:</b>	Visual Maps
<b>Appendix H:</b>	Glossary of Terms
<b>Appendix I:</b>	Details of the Noise Measurement Survey and Existing Noise Climate Condition Assessment
<b>Appendix J:</b>	Assessment of Noise Impact
<b>Appendix K:</b>	Minutes of the Provincial Authorities Meeting
<b>Appendix L:</b>	Minutes of Focus Group Meetings
<b>Appendix M:</b>	Minutes of the Public Meeting
<b>Appendix N:</b>	Minutes of the Key Stakeholders Workshop
<b>Appendix O:</b>	Letter from Eskom regarding Water Supply