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**Note: All figures referred to in this section are presented in A3 flat format and are contained in a separate folder.**

## **6.5 Landscape and Visual Impact Assessment (LVIA)**

### **6.5.1 Assessment Methodology**

The assessment of landscape and visual impacts takes account of the IFC PS 6 and EBRD PR 6 requirement that the design of Project components records the potential impacts upon the landscape as a natural resource, and the requirements of IFC PS 3 and EBRD PR 3 which state that the potential for visual impacts related to Project activities is assessed. Recognition is given to the potential visual impact of proposed Project components on people (visual receptors). This analysis considers the visual impacts experienced by receptors, including Project-affected communities and individual receptors and groups of receptors, from identified representative vantage points (viewpoints) and/or areas where the Project will be visible by transient visual receptors (for example roads and tracks). The methodology used for the assessment was developed in accordance with UK current good practice guidance including that contained within the *Guidelines for Landscape and Visual Impact Assessment – Third Edition*<sup>1</sup> (GLVIA 3). GLVIA3 provides guidance on the assessment of both landscape and visual impacts, including assessing the overall significance of impacts, taking account of the sensitivity of the receptor and the magnitude of the impact. The methodology developed for the LVIA generally conforms to the methodology used for ESIA as a whole, as defined in Section 6.1, but has been refined to take on board the details of the subject-specific guidance outlined in GLVIA3. The following methodology outlines deviations from the general methodology outlined in Sections 6.1 to 6.3.

### **6.5.2 Data Sources**

The landscape and visual impact assessment (LVIA) was informed by data gathered from the sources of baseline information listed below:

- Base mapping (1:100,000 and 1:50,000 maps);
- Field surveys and baseline site photography;
- Aerial imagery;
- Computer generated Zones of Theoretical Visibility (ZTVs);
- Computer modelled images (wireframes and photomontages); and
- Baseline information from other associated environmental disciplines within the ESIA.

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<sup>1</sup> *Guidelines for Landscape and Visual Impact Assessment, Third Edition* (2013) The Landscape Institute and Institute for Environmental Management and Assessment.

Sources used for the modelling of potential visibility included the following digital data:

- 3-D Topography information at 5 m contour intervals; and
- 3-D Topography information at 25 m contour intervals.

### **6.5.3 Key Steps in Methodology**

An iterative approach was adopted during the design and development of the Project, enabling an understanding of the baseline environment and the early identification of potential impacts to be fed into the evolving design, refining and adapting it so as to help develop the final Project proposals.

The key steps in the methodology were as follows:

- Identification of designations of relevance to landscape and visual amenity;
- Identification of landscape features that may be affected by the Project;
- Identification and description of Landscape Character Types (LCTs) located across the study area, informed by field surveys (undertaken during April and June 2013), taking into account aspects such as geology, topographical structure, vegetation, features of landscape importance (e.g. cultural, archaeological, ecological), existing condition, quality and any given value (reflecting landscape designations);
- Determination of the sensitivity of each LCT to the type and scale of the Project, taking account of their value and susceptibility to change;
- The production of a draft ZTV for the Project study area, using computer modelling extending to up to a 15 km radius from the outermost components of the Project, in order to determine the study area, and to identify potential landscape and visual receptors and representative viewpoints;
- Iterative Project design development (see Chapter 5 Alternatives Analysis), and identification and evolution of appropriate measures to mitigate potential impacts;
- Identification of representative viewpoints to inform the visual assessment, and which are representative of the range of views and types of receptor likely to be affected, and determination of the nature or sensitivity of the receptors they represent to change, taking account of their value and susceptibility to change;
- The production of computer modelled wireframe and photomontage images of the Project from an appropriate selection of representative viewpoints;
- Making judgements about the nature or magnitude of impacts on the landscape (both in terms of direct changes to landscape features and resources, and indirect changes

- to the character of surrounding landscapes) of each LCT, taking cognisance of scale and extent, duration and reversibility;
- Making judgements about the nature or magnitude of impacts on views and visual amenity at each representative viewpoint, taking cognisance of scale and extent, duration and reversibility;
  - Making judgements about the significance of the potential resultant landscape and visual impacts, and setting out the required mitigation measures;
  - Evaluation of the level and significance of residual impacts following the application of mitigation measures (i.e. assuming mitigation is taken on board) upon each landscape and visual receptor; and
  - Consideration of cumulative issues so as to judge the impacts of the Project in combination with other ongoing, committed or proposed developments, or other anticipated changes nearby.

### ***Impacts Assessed in Full***

The following impacts are assessed:

- Impacts on landscape resources, including physical changes to the landscape as well as changes in landscape character resulting from a Project activity;
- Impacts on areas designated for their scenic or landscape qualities, at a national or local level;
- Impacts on visual amenity, extending to examination of changes in views arising from the introduction of the Project components in those views;
- Impacts on landscape and visual receptors resulting from changes in relation to the interaction between the development and other existing or proposed developments of a similar nature or scale (cumulative impacts) (see Chapter 7 Cumulative Impacts).

### ***Impacts Scoped Out***

On the basis of desk and field based work, initial assessment, the professional judgement of the LVIA team and experience from other relevant projects, the following potential impacts have been 'scoped out':

- Impacts on landscape and visual receptors beyond around 15 km from the outermost components of the Project, where it is judged that potential significant impacts are unlikely to occur;

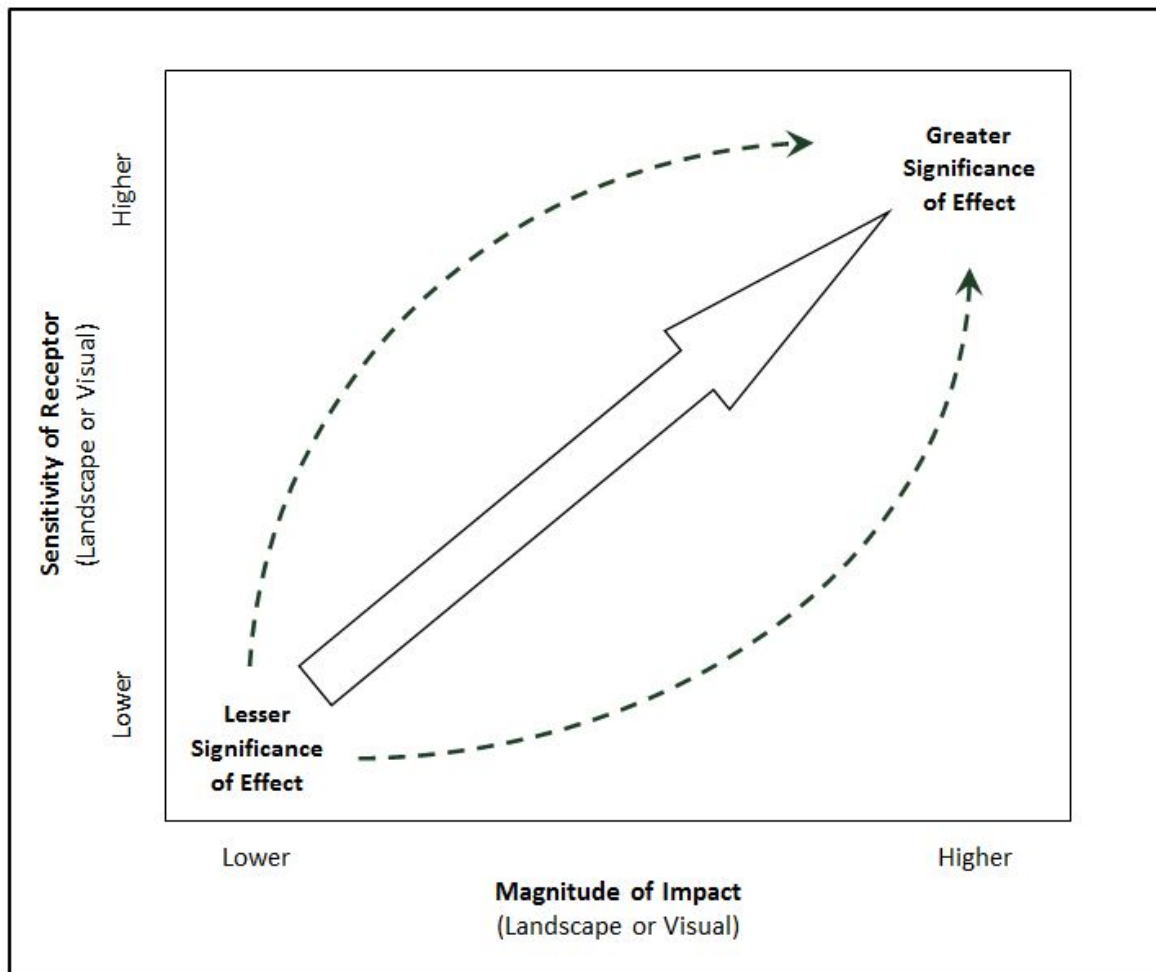
- Locations where receptors are unlikely to be affected by the Project, through having minimal or no predicted visibility, as predicted by the ZTV.

#### **6.5.4 Approach**

The assessment of both landscape and visual effects requires consideration of the nature or **sensitivity** of receptors (taking account of their value and their susceptibility to change) and the nature or **magnitude** of the impact (taking account of scale and extent, duration and reversibility). Each variable is examined, and professional judgements made, based on the use of a consistent set of standard terms. The resulting judgements are then weighed up, through the application of professional knowledge and experience, in order to arrive at a reasoned statement regarding the nature, level and significance of each effect.

The assessment of landscape and visual effects is based on the weighing up and evaluation of the various contributory aspects, resulting in the presentation of a reasoned judgement as to how each has been assessed, and their contribution to the overall level and significance of the identified resultant landscape and visual effects.

A matrix, where the significance of effect is defined based on the direct correlation between the level of sensitivity and the magnitude of the impact, is therefore not used. Each effect can however be evaluated with reference to Diagram 6.5.1, which is shown below as a guide.



**Diagram 6.5.1: Determining Significance of Effect**

### **6.5.5 Landscape Sensitivity**

The sensitivity of a landscape receptor varies depending on the condition of the existing landscape and its capacity to accommodate change. Landscape sensitivity is assessed in terms of the susceptibility of a landscape receptor to the type of change proposed and the value attached to the receptor. Landscape sensitivity varies according to the type of development proposed and the individual elements, key characteristics, inherent quality or condition, capacity to accommodate change, and the specific qualities associated with any landscape designations that may apply.

#### ***Susceptibility of Landscape Receptors***

Susceptibility is defined as *“the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular type or area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the proposed*

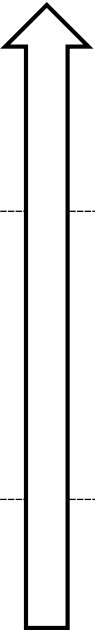


*development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies” (GLVIA 3 Para 5.40).*

### **Landscape Value**

Landscape value is recognised as being a key contributing factor to the sensitivity of landscape receptors, and is determined with reference to the presence of relevant designations and their level of importance. In the absence of designation, reference is made to performance against criteria which are indicative of value, such as condition, scenic quality, rarity, representativeness, conservation interests, recreation value, perceptual aspects, and associations. Value encompasses both that of individual components of the landscape, as well as its resulting overall character.

Judgements regarding the sensitivity of landscape receptors are recorded as **high**, **medium** or **low**<sup>2</sup> as indicated in Table 6.5.1 below.

<b>Table 6.5.1: Determining Sensitivity of Landscape Receptors (susceptibility and value)</b>	
	<p><b>High</b></p> <p>A landscape of particularly distinctive character, where its character, land use, pattern and scale may offer very limited opportunities for the accommodation of change, and/or development of successful mitigation, and which is therefore highly susceptible to change. May be internationally or nationally designated and valued landscapes. Landscapes or landscape features may display a strong degree of intactness and/or scenic quality, and/or particular rarity.</p>
	<p><b>Medium</b></p> <p>A landscape of notable character, which may offer some opportunities for the accommodation of change due to its nature, land use, pattern and scale, but which may demonstrate some susceptibility to the type of change proposed. May offer more opportunity for the development of successful mitigation. May be nationally, regionally or locally designated and valued landscapes. Landscapes or landscape features may display, to a lesser degree, relative intactness and/or scenic quality, and/or some rarity.</p>
	<p><b>Low</b></p> <p>A landscape which is of low scenic quality, and/or where its character, existing land use, pattern and scale are of low susceptibility to change and/or offer very good opportunities for successful mitigation, or enhancement. May be locally designated and valued landscapes. Landscapes or landscape features may display little landscape and/or scenic quality, and may be commonplace.</p>
<p>Note: there is a gradual and blurred transition between each grade and judgments about the sensitivity of landscape receptors may include individual features or areas.</p>	

<sup>2</sup> Note that a category of ‘very high’ sensitivity as defined elsewhere within the ESIA methodology is not used within this landscape and visual assessment.

### **6.5.6 Magnitude of Landscape Impacts**

Impacts on landscape receptors are evaluated with regard to their magnitude, which encompasses size and scale, geographical extent duration and reversibility, which are outlined in more detail below.

#### ***Size and/or Scale, and Geographical Extent***

This is a measure of the extent of existing landscape elements that will be lost, the proportion of the resource that this represents, the contribution of such elements to the character of the landscape, and the size of the geographical area across which the impacts will be felt. In terms of landscape character, this reflects the degree to which the character of the landscape will change by removal or addition of landscape components, and how the changes will affect key characteristics. Size/scale is described as being **large**, **medium** or **small**, and the geographical extent over which the impact will be experienced is described as **widespread** or **localised**, i.e. at a regional level, or associated with the more immediate setting of the site.

#### ***Duration***

Duration is reported as **long-term** (a permanent impact remaining from construction and operation of the Project after mitigation measures have been applied, generally lasting over 15 years), **medium-term** (generally 3-15 years), or **short-term** (an impact that will occur during construction or operation activities, lasting throughout the relevant Project stage, generally lasting less than 3 years). Impacts which last for the life of the project but which will not extend beyond closure, or will be very much reduced at this stage are considered to be medium-term.

#### ***Reversibility***

Reversibility is reported as **permanent**, **partially reversible** or **reversible**.

Judgements regarding the magnitude of landscape change are recorded as **high**, **moderate**, **low** or **barely perceptible**, as indicated in Table 6.5.2 below.

Table 6.5.2: Magnitude of Landscape Impact (Size and/or scale, geographical extent, duration, reversibility)	
<b>High</b>	A large change in landscape characteristics and/or over extensive geographical area and/or which may result in an irreversible landscape impact.
<b>Moderate</b>	A moderate change in landscape characteristics and/or which may be over a large geographical area, and/or which may be reversible over a long duration of time.
<b>Low</b>	A small change in characteristics of the landscape and/or which may be over a relatively localised geographical area, and/or which may be reversible over a short duration of time.
<b>Barely perceptible</b>	A virtually imperceptible change in characteristics of the landscape and/or which is focused on a small geographical area, and/or which is almost or completely reversible.

### 6.5.7 Assessing the Significance of Landscape Effects

The evaluations made against each consideration are set out, and then considered together to provide an overall profile of each identified landscape impact. An overview is then taken of the distribution of judgements for each aspect, in order to make an informed professional assessment of the overall significance of each resultant landscape effect. This overview balances and takes account of the relative importance of each aspect. Although without a numerical or formal weighting system, appropriate weight is therefore given to the relative importance of each of the aspects that must be considered.

#### Levels of Landscape Effect, and Significance

Following evaluation of sensitivity (susceptibility, value), and magnitude (size and/or scale, geographical extent, duration and reversibility), the overall significance of the landscape effect is determined, by making an informed professional judgement, on the basis of weighing up all aspects that have been considered.

The levels of landscape effect are described as being **major**, **moderate**, **minor** or **negligible**, in line with Table 6.5.3 and whereby **major** and **moderate** effects are considered significant. Note that there is a gradual, blurred transition between levels.

Table 6.5.3: Levels of Landscape Effect	
<b>Major</b>	Changes substantially affecting the character of the landscape or the elements therein. For example, a major impact is likely when a receptor of high sensitivity is affected by a high magnitude of landscape impact.
<b>Moderate</b>	Change affecting, to a lesser degree, the character of the landscape or the elements therein. For example, a moderate impact is likely when a receptor of medium sensitivity is affected by a moderate magnitude of landscape impact.
<b>Minor</b>	Slight change affecting the character of the landscape or specific elements therein. For example, a minor impact is likely when a receptor of low sensitivity is affected by a low magnitude of landscape impact.
<b>Negligible</b>	No or minimal perceptible change, affecting the character of the landscape or specific elements therein. Note that this includes locations where there will be no landscape impacts.

Landscape effects are described as either **not significant** or **significant**, as outlined in Table 6.5.4 below.

Table 6.5.4: Significance of Landscape Effects	
<p><b>Not Significant</b></p> <p>Landscape effects may be reversible and/or of short duration, and/or over a restricted area, affecting elements and/or characteristics (including aesthetic and perceptual aspects) that contribute to but are not key to the character of landscapes.</p>	<p><b>Significant</b></p> <p>Landscape effects may be long-term and/or irreversible, and/or over an extensive area, affecting elements and/or characteristics (including aesthetic and perceptual aspects) that are key to the character of nationally valued landscapes.</p>

### ***Direction of Landscape Effects***

The direction of effect (**adverse**, **positive**, or **neutral/mixed**) is determined in relation to the degree to which the proposal fits with the existing landscape character, and the contribution the Project makes to the landscape.

### **6.5.8 Visual Sensitivity**

The visual impact assessment assesses the impact of the proposed project on views, and the visual amenity of receptors (i.e. people who could experience views of the Project). A particular person or group of people will be affected by a change in view or visual amenity in different ways. Visual sensitivity is assessed in terms of the susceptibility of the receptor to change in views/visual amenity and the value attached to particular views.

### ***Susceptibility of Visual Receptors***

The susceptibility of visual receptors to changes in views/ visual amenity is a function of the occupation or activity of people experiencing the view and the extent to which their attention is focused on views.

### ***Value Attached to Views***

A judgement is made about the value attached to views included within the assessment of visual impacts, and takes account of the following key considerations:

- Recognition of the value attached to specific views, in relation to key landscape features, heritage assets or designation;
- Indicators of value attached to specific views by receptors (specifically visitors and tourists), through appearance in guidebooks or on maps, or through the provision of facilities to experience the view.

Judgements regarding the sensitivity of visual receptors are recorded as **high, medium or low**<sup>2</sup> according to Table 6.5.5.

<b>Table 6.5.5: Determining Sensitivity of Visual Receptors (susceptibility and value)</b>	
<b>High</b>	Communities where views contribute to the landscape setting enjoyed by residents; people engaged in outdoor recreation (i.e. users of recreational paths whose interest is likely to be focused on the landscape); visitors to heritage assets or other attractions where views of surroundings are an important contributor to experience, and travelers on scenic routes where attention is focused on the surrounding landscape. These are receptors which are deemed to be of high susceptibility to change. Recognized views, perhaps referred to in literature, recorded in guide books or on maps.
<b>Medium</b>	Recreational travelers on roads; people at their place of work whose attention is not on their surroundings, but where setting is important to the quality of their working life. These are receptors which are deemed to be of medium susceptibility to change. Views which are not formally recognized, but which may be valued locally.
<b>Low</b>	People engaged in long distance travel on roads, outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape; people at their place of work whose attention is not on their surroundings, and where setting is of less important to the quality of working life. These are receptors which are of low susceptibility to change. Views which more ordinary, and which are not specifically valued.
Note: there is a gradual and blurred transition between each grade. The presence of a large number of viewers in a location that will otherwise be of low or medium sensitivity may increase the sensitivity.	

### **6.5.9 Magnitude of Visual Impacts**

The overall magnitude of each visual impact is evaluated with regard to the following aspects: size and/or scale, geographical extent, duration and reversibility. These aspects are outlined in more detail below.

#### ***Size and/or Scale***

The size and/or scale of the visual impact takes account of:

- The scale of the change in view with respect to the loss or addition of features and /or changes in composition, including the proportion of the view occupied by the proposed development;
- The degree of integration of new features or changes in the landscape into the existing view, in terms of aspects such as form, scale and mass, line, height, colour and texture; and
- The nature of the view of the proposed development, in terms of the relative amount of time over which it will be experienced and whether views will be full, partial or glimpses.

In this assessment of size/scale is described as being **large, medium, small** or **imperceptible**.

#### ***Geographical Extent***

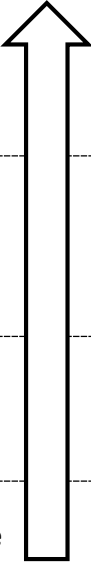
The geographical extent of the visual impact, described as **widespread, localised**, or **immediate** varies in relation to different viewpoints and reflects:

- The direction or bearing of view of the development in relation to the main activity or view experienced by the receptor;
- The distance of the viewpoint from the proposed development; and
- The extent of the area over which the changes will be visible.

#### ***Duration/Reversibility***

Duration is reported as **short-term** (0-3 years – an impact that will occur throughout the exploration and construction phase), **medium-term** (3-15 years – impact that will occur during the operations, decommissioning and closure) and **long-term** (over 15 years – an impact that will remain following the life of the Project and the application of restoration measures). Reversibility is reported as **permanent, partially reversible**, or **reversible**.

Judgements regarding the magnitude of visual impacts are recorded as **high**, **moderate**, **low** or **barely perceptible**, as indicated in Table 6.5.6 below.

<b>Table 6.5.6: Magnitude of Visual Impact</b> <b>(Size and/or scale, geographical extent, duration, reversibility)</b>	
<b>High</b> 	Substantial changes, which may be seen for a long duration, and/or be clearly perceptible, and/or which may be in stark contrast with the existing view, and/or obstruction of a substantial part or important elements of views beyond the Project main area, and/or which may result in an irreversible change.
<b>Moderate</b>	Location affected by moderate changes in views, and/or visible for a shorter duration, perhaps at a slight angle from the main focus of the view, and/or where changes may be in contrast with the existing view, and/or obstruction of a noticeable part or elements of views beyond the Project main area. The change may be reversible over a long duration of time.
<b>Low</b>	Location affected by slight changes in views, and/or visible for a short duration, perhaps at an oblique angle, and/or which may fit to an extent with the existing view. The change may be reversible over a shorter duration of time.
<b>Barely Perceptible</b>	Location affected by a change which is barely visible, and/or visible for a very short duration, perhaps at an oblique angle to the main focus of the view, and/or which may blend with the existing view, usually at some distance from the Project, and/or where the change is almost or completely reversible.

#### **6.5.10 Assessing the Significance of Visual Effects**

As for landscape impacts, the evaluations against the considerations above are set out together to provide an overall profile of each resultant visual effect. An overview is then taken and an informed professional assessment made of the overall significance of each visual effect. This overview takes account of the judgements made in relation to each aspect considered. Therefore, although without a numerical or formal weighting system, appropriate attention is given to the balance and relative importance of each aspect in each case.

#### **Levels of Visual Effect, and Significance**

Levels of visual effect are described as being **major**, **moderate**, **minor** or **negligible**, outlined in Table 6.5.7 below and in line with Table 6.5.3, and where **major** and **moderate** effects are considered significant. Note that there is a gradual, blurred transition between levels.

Table 6.5.7: Levels of Visual Effect	
<b>Major</b>	Changes substantially affecting views and visual amenity. For example a major impact is likely when a receptor of high sensitivity is affected by a high magnitude of visual impact.
<b>Moderate</b>	Change affecting, to a lesser degree, views and visual amenity. For example a moderate impact is likely when a receptor of medium sensitivity is affected by a moderate magnitude of visual impact.
<b>Minor</b>	Slight change affecting views and visual amenity. For example a minor impact is likely when a receptor of low sensitivity is affected by a small magnitude of visual impact.
<b>Negligible /None</b>	No or minimal perceptible change, affecting views and visual amenity. Note that this includes locations where there will be no impacts.

Following evaluation of the various considerations (sensitivity: susceptibility, value; and magnitude: size and scale, geographical extent, duration and reversibility), the overall significance of the visual effect is determined, by making an informed professional judgement, taking account and weighing up all the aspects which have been considered.

Visual effects are described as either **not significant** or **significant**, as outlined in Table 6.5.8 below.

Table 6.5.8: Significance of Visual Effects	
<p><b>Not Significant</b></p> <p>Visual effects on people who are generally less sensitive to changes in views/ visual amenity.</p> <p>Small changes and/or changes which are well integrated into the view, often involving features already present in the view.</p> <p>These may be reversible effects/ or of short duration.</p>	<p><b>Significant</b></p> <p>Visual effects on people who may be particularly sensitive to changes in views/ visual amenity, and/or at recognised viewpoints or recognised scenic routes.</p> <p>Large scale changes which introduce new, non-characteristic or discordant or intrusive elements into the view.</p> <p>These may be long-term/ irreversible effects.</p>

### ***Direction of Visual Effects***

The direction of effect (**adverse**, **positive** or **neutral/mixed**) is determined in relation to the degree to which the proposal fits with existing views, and the contribution to the view that the Project makes.



### 6.5.11 Key Terminology

The key terminology used in this assessment is set out in Table 6.5.9 below.

Table 6.5.9: Key Considerations and Terms			
Consideration	Terminology		
<b>Sensitivity</b>	Low	Medium	High
<b>Susceptibility</b>	Low	Medium	High
<b>Value</b>	Local	Regional	National/International
<b>Magnitude</b>	Low / Barely perceptible	Moderate	High
<b>Size/scale</b>	Small	Medium	Large
<b>Extent</b>	Immediate / Individual	Local / Localized	Regional / Widespread
<b>Duration</b>	Short-term (0-3yrs)	Medium-term (3-15yrs)	Long-term (>15yrs)
<b>Reversibility</b>	Fully reversible	Partly reversible	Permanent
<b>Frequency</b>	Infrequently intermittent	Frequently intermittent	Continuous
<b>Direction</b>	Positive	Mixed/Neutral	Adverse
<b>Significance</b>	Minor / Negligible	Moderate	Major

### 6.5.12 Project Components Related to Landscape and Visual Resources

Sources of potential landscape and visual impact were identified based on Project activities, and the related Project components. The Project consists of a number of components of different size and scale in relation to the existing landscape. These components will occupy varying extents of the Project-affected area and result in varying levels of impact, of both a direct nature in relation to landscape resources, and an indirect nature in relation to wider landscape character and visual amenity. Those components of greatest size and extent will generally result in the greatest impacts on both landscape and visual receptors.

The key components of the development which will be the main sources of landscape and visual impacts will be:

- Open pits: Erato and Tigranes/Artavazdes;
- Barren Rock Storage Facility (BRSF);
- Haul and access roads;
- Crushing and screening facility (contains the primary and secondary crusher and building fabric that contains these units);
- Low-grade ore stockpile;
- Run of Mine (ROM) stockpile
- Overland conveyor, and truck load-out area;
- Truckshop and administration facilities;
- Passive water treatment system;

- Worker accommodation camp; and
- Heap Leach Facility (HLF) including:
  - Heap leach pad (HLP);
  - Contact water, process and storm water ponds; and
  - Adsorption-Desorption-Recovery (ADR) plant.

An existing 110kV power-line runs roughly north-south from a primary substation near the M-2 highway to the Jermuk substation; the line then continues south towards Gorayk. A new main substation will be built for the Project next to this line close to the RD-3/RD-1 road junction. Overhead 35kV power lines will run from the main substation along the conveyor to the mine facilities and crushing plant, and to the truck load out and ADR Plant. At these points area substations will further step down the voltage and distribute power to the individual components of the mine maintenance facilities, crushers and transfer conveyors, HLF, ADR plant, and Arpa River water supply pump station.

Other infrastructure and componentry are described in more detail within Chapter 3: Project Description and the overall project componentry plan is shown on Figure 3.1.

Lighting associated with some componentry and infrastructure of the proposed Project will be visible during hours of darkness and where applicable, consideration of visual impacts associated with the lighting of specific componentry is included within the assessment.

#### **6.5.13 Project Phases and Assessment Phases**

The LVIA has considered a sequence of four main Project phases<sup>3</sup> (these are a simplification of the more detailed phases and sub-phases set out in the Project description, in order that the landscape and visual impacts associated with each key phase can be set out and illustrated), which are outlined in Table 6.5.10 below. In order to capture the potential landscape and visual changes experienced throughout the life of the Project, these Project phases required some summarisation and grouping as fully detailed in Chapter 3 Project Description:

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<sup>3</sup> The exploration phase of the project, as described with Chapter 3: Project Description has not been assessed within the LVIA. Disturbance across the project site caused by exploration or construction activities cannot in many cases be clearly distinguished, therefore any impacts from the exploratory phase have been considered within the assessment of construction phase impacts.

- Construction Phase;
- Operations Phases<sup>4</sup>;
- Closure Phase;
- Post-Closure Monitoring Phase.

Whilst the Project is live, it will be divided into the three main phases (construction through to closure); however, in practice there will be a fluid transition between the end of one phase and the start of the next, and some activities will occur concurrently. For example, restoration and closure of the open pit at Tigranes/Artavazdes will commence with the opening of the Erato pit whereby barren rock from the Erato pit will be used to backfill the Tigranes/Artavazdes pits. At closure, the Erato pit will be partially backfilled with barren rock from the Erato pit to an estimated depth of approximately 30m above the final pit depth.

Within each Project phase a number of project activities are identified and are scheduled to be undertaken at different stages within the life of the Project, as outlined within the project description. Landscape and visual impacts associated with the following Project phases are considered at five different assessment stages, as outlined in Table 6.5.10 below:

<b>Table 6.5.10: Project and Assessment Phases</b>			
<b>Project Phase</b>	<b>Year</b>	<b>Key Project Activities</b>	<b>Assessment Phase</b>
<b>Construction<sup>5</sup></b>	<b>Years -2 to -1</b>	Ongoing exploratory activities, construction of Project infrastructure (including HLF)  Night time lighting	Assessment at c. year 2 of construction (assumed to be before open pit extraction begins) Representing: <b>Construction Phase: Year -1</b>
<b>Operations Phase</b>	<b>Years 1 to 3</b>	Ongoing exploratory activities, extraction of barren rock and ore from Tigranes/Artavazdes open pit, operation of HLF and BRSF  Night time lighting	Assessment at c. Year 3 of operations (assumed to be before extraction of the Erato open pit begins). Representing: <b>Operations Phase: Year 3</b>

<sup>4</sup> Operations Phase defined as between the start and end of the mining and ore processing period.

<sup>5</sup> Includes consideration of evident disturbance caused during exploration phase of the project.

**Table 6.5.10: Project and Assessment Phases**

Project Phase	Year	Key Project Activities	Assessment Phase
<b>Operations Phase</b>	<b>Years 4 to 10</b>	Ongoing exploratory activities, extraction of barren rock and ore from Tigranes/Artavazdes, and Erato open pit, operation of HLF and BRSF  Night time lighting	Assessment and illustration at c. Year 10 of operational Project phase (assumed to be when Erato open pit, Tigranes/Artavazdes open pit, and the HLF & BRSF are all at their maximum size). Representing: <b>Operations Phase: Year 10 - Maximum Case Scenario</b>
<b>Closure</b>	<b>Years 11 to 14</b>	Cessation of production, closure activities and restoration measures	Assessment at c. Year 14 of Project (assumed to be when closure works cease (note some operations continue to year 11)). Representing: <b>Closure Phase: Years 11-14</b>
<b>Post-Closure Monitoring</b>	<b>Years 15 to 19</b>	Post-closure monitoring of closure activities and restoration measures	Assessment and some illustration at c. Year 19 of Project (assumed to be when restoration proposals have matured). Representing: <b>Post-Closure Monitoring Phase: Year 19</b>

A brief outline of the Project activities and Project components involved within each phase of the Project are provided below. More detailed information is provided within Chapter 3 Project Description.

### **Construction Phase: Years -2 to -1**

During this phase of the Project the main construction works will be undertaken and will include construction of support infrastructure, haul roads, access roads, the BRSF, the crushing and screening facility, which will occupy an area of approximately 13.9 ha, overland conveyor and truck load-out area, which will occupy an area of approximately 19.3 ha (a length of approximately 5.6 km), the HLF, process ponds and ADR plant which will occupy an area of approximately 165.5 ha, substations, maintenance workshop and accommodation facilities. Two quarries will be developed to supply aggregate for construction, together with crushed, non-acid generating barren rock from developing the open pit that will be used to construct the base of the haul roads. The construction of these Project components and the final completed components will become perceptible during this phase, which will last for a period of approximately two years.

The utilisation of the workers accommodation camp will be reduced at the end of the construction phase. The area occupied by the camp will be restored, topsoil replaced and returned to grassland following the closure and removal of the camp.

### ***Operations Phase: Years 1 to 3***

During this phase, Project mining operations will begin, with the extraction of barren rock and ore from the Tigranes/Artavazdes open pit, depositing of barren rock on the BRSF and ore on the phases 1 and 2 areas of the HLF respectively. The progressive change in the profile of the open pit will become perceptible on the skyline during this period. The open pit will occupy an area of approximately 96.8 ha. During this phase the HLF will occupy an area of approximately 46 ha and at its highest vertical extent, will reach 80 m at approximately 1712 m asl. Phase 1 and 2 areas of the HLF will be approximately 40% of the total eventual extent of the HLF and will progressively increase in vertical height, as the depositing of ore takes place. The phase 1 area of the HLF will reach its maximum height of 1664 m asl in four lift stages of 8 m each, and phase 2 will add a further six lifts. Vehicle movements on site and the operation of Project components will be perceptible throughout this phase, which will last for a period of approximately three years.

### ***Operations Phase: Years 4 to 10 – Maximum Case Scenario***

During this phase, Project mining operations will extend to create the Erato open pit (starting in Year 4) resulting in a progressive change in the profile of the skyline alongside the existing open pits of Tigranes/Artavazdes. The second pit will become perceptible on the skyline. Barren rock from the Erato open pit will be deposited as backfill within the open pit of Tigranes/Artavazdes beginning in Year 4, and ore will be deposited on the phases 3 and 4 areas of the HLF. Low grade ore stockpiled at the BRSF will continue to be processed until Year 10. The extraction of ore from the Tigranes/Artavazdes open pit will cease during approximately Year 8 of the Project. During this phase of the project, the BRSF and HLF will progressively increase in size as the depositing of barren rock and ore continues. The phase 3 area of the HLF will reach its maximum vertical height of 1768 m asl at the completion of this phase, following the seven designed lift stages of 8 m. The final, phase 4 area of the HLF will reach its maximum vertical height of 1856 m asl in Year 10 at the completion of this operational phase, following the 11 designed lift stages of 8 m. The maximum height of the HLF will be 120 m above the heap leach pad liner at the completion of this phase. Vehicle movements on site and the operation of Project components will be perceptible throughout this phase, which will last for a period of approximately seven years. The potential landscape and visual impacts identified at Year 10 of the Project represent a potential 'Maximum Case

Scenario', when the Project is at its largest potential extent covering total Project Footprint area of approximately 609 ha.

Potential visual impacts arising from the lighting of Project components and lighting from plant machinery and vehicles on site within this period are considered as part of the overall judgements made regarding the impacts of night time lighting. This assessment of lighting impacts represents the maximum case scenario of lighting impacts likely to be experienced throughout the life of the Project.

#### ***Closure Phase: Years 11 to 14***

The closure phase of the Project will begin before the completion of the operations phase, with progressive restoration of the BRSF from Years 3 to 7 and of the Tigranes/Artavazdes and Erato open pits from approximately Years 4 and 9 of the Project, respectively. Following the cessation of all mining and processing activities in Year 10, closure will commence with the reclamation of the HLF, ponds, south and east facing slopes of the BRSF and removal of other componentry, together with the dismantling of infrastructure and restoration of these and other disturbed areas in order to seek to establish a grassland vegetation cover which supports habitats similar to those present on the Amulsar site prior to the commencement of the Project in accordance with the Preliminary Mine Reclamation, Closure and Rehabilitation Plan (pMRCRP, see Appendix 8.18).

#### ***Post-Closure Monitoring Phase: Years 15 to 19***

Once closure activities and restoration measures are implemented, post-closure monitoring is expected to continue until approximately Year 19 of Project (nine years after the completion of mining activities), to ensure that restoration and aftercare is maintained and to implement remedial actions as required. The potential landscape and visual impacts identified at Year 19 of the Project are assessed from each viewpoint and supported by visualisations from three representative viewpoints showing the proposed Project at Year 19, following implementation of the proposed closure activities and restoration measures. During this period, it is expected that low level grassland vegetation will become progressively more noticeable as it becomes established across the former disturbed areas, and that any trees which are planted at lower levels on the mountain will have grown to a reasonable size.

#### ***6.5.14 Potential Landscape and Visual Impacts***

Landscape and visual impacts will result from alterations to the landscape during the construction and operational phases, and will gradually diminish post closure and restoration.

Landscape and visual impacts will vary in intensity throughout the Project development phases, as well as from location to location, depending upon the focus of activities at different times.

A detailed outline of the activities associated with each of the above Project phases is included in Chapter 3: Project Description; however, the activities which define each Project phase are outlined in Table 6.5.10 and give rise to the potential landscape and visual impacts summarised below.

***Potential Impacts: Construction Phase: Years -2 to -1***

Potential landscape and visual impacts resulting during the construction phase will arise from visible surface alterations and construction activities, including those arising from (see also Chapter 3: Project description and Figure 3.1):

- Use of the existing access track from access junction D at Kechut (see Figure 3.24) by construction vehicles bringing materials, components and workers involved in construction of the mine facilities at the top of the mountain;
- Use of the existing road from access junction B (see Figure 3.24) by vehicles bringing materials, components and workers involved in construction of the conveyor and nearby facilities;
- Use of the existing track from access junction A (see Figure 3.24) by vehicles bringing materials, components and workers involved in construction of the HLF facility;
- Construction of the worker accommodation camp, to the south of the HLF;
- Construction of the main haul road on the western side of Amulsar Mountain and the movement of vehicles between the worker accommodation camp area, the open pits, the BRSF and the building that will house the crushing and screening facility;
- Establishment of working, storage and fabrication areas, offices and maintenance workshops;
- The erection of site and security fencing around Project facilities;
- Installation, movement and storage of surface construction machinery, and delivery lorries;
- Clearing of vegetation, topsoil and subsoil, and construction of topsoil and subsoil stockpiles to a height of 3m to 5m (with the option to construct screening bunds using subsoil and dressed with a topsoil horizon, so that the outer facing slope can be vegetated and maintained for the duration of the operational phase), to store the materials for use in restoration and/or provide a barrier between operational and non-operational land;

- Land clearing, earthworks and installation of pad-liners for the BRSF and HLF;
- Construction of the building that contains the crushing and screening facility, overland conveyor, ADR plant and collection ponds;
- Lighting of vehicles, lay down areas and Project components with temporary lighting; and
- Landscape works and post-construction restoration activities such as removal of temporary laydown areas.

The construction phase of the Project therefore has potential to result in significant, albeit short to medium-term and, to an extent, intermittent impacts on both landscape and visual receptors.

***Potential Impacts: Operations Phase: Years 1 to 3***

Potential landscape and visual impacts resulting during the early operation of the Project will include continuing change to the landform, operation and activities, which are visible from outside the Project-affected area, as well as those associated with people and vehicle movements, and the operation of mobile plant. They include (see also Chapter 3: Project description):

- Restoration of quarries developed during the construction phase for supply of aggregates;
- Restoration of laydown and storage areas used during the construction phase;
- Use of the Project access and haul roads by vehicles bringing workers and materials to and from the Project-affected area (see Chapter 6.19: Transport);
- The medium-term presence of all Project components, stockpiled materials, and ancillary infrastructure in the landscape and in views;
- Operation of the Tigranes/Artavazdes open pit, including changes in the profile of the skyline;
- Movements of mine vehicles between the open pits, the BRSF and the crushing and screening facility;
- Operation of the crushing and screening facility;
- Operation of the overland conveyor between the crushing and screening facility and truck load-out facility, and haulage of the crushed ore to the HLF;
- Operation of the BRSF and the phase 1 and 2 areas of the HLF, including mine vehicle movements and increases in the size of both these Project components during this Project phase; and
- Lighting of project components, ancillary infrastructure and vehicles.



The operations phase therefore has potential to result in significant, albeit medium-term and, to an extent, intermittent impacts on both landscape and visual receptors.

***Potential Impacts: Operations Phase: Years 4 to 10 – Maximum Case Scenario***

The assessment of this Project phase is supported by viewpoint visualisations from 17 representative viewpoints showing the proposed Project at Year 10, including reference to winter conditions from five viewpoints.

The potential for the visible presence of dust across snow fields during winter is also considered in the assessment. Fallout of dust from blasting and mining operations will be visible as darker particulates on the surface of the snow, particularly later in the late winter and early spring when there is less frequent fresh snowfall, and when the sun may result in earlier melting of darker areas of the snow pack. The grey/yellow colouration of snow by atmospheric dust, particularly during later winter and early spring is a natural phenomenon, but this may be emphasised slightly by the greater level of atmospheric disturbance around the site, as a result of the works. Other operations that could highlight the visibility of Project components include use of rock salt, exposing darker surfaces beneath the snow, and snow clearance that could result in exposing the underlying darker surface, and the presence of snow mounds that could be visible adjacent to working areas and the mixing of snow with darker particulate matter from the underlying surface.

Dust will be less apparent during other months (before winter snow cover or following snow melt), as it will be less visible against the brown or green of the underlying landscape.

Potential landscape and visual impacts resulting during the later operations phase of the Project will arise from operational activities and visible surface alterations to the major Project components (i.e. the open pits, BRSF and HLF), including those arising from (see also Chapter 3 Project Description):

- Use of the Project access roads by vehicles bringing workers and materials to and from the Project-affected area;
- The medium-term presence of all Project components, stockpiled materials, and ancillary infrastructure in the landscape and in views;
- Movements of mine vehicles between the open pits, the BRSF and the crushing and screening facility;
- Operation of the Tigranes/Artavazdes, and Erato open pits, including changes in the profile of the skyline;

- Operation of the crushing and screening facility;
- Operation of the overland conveyor between the crushing and screening facility and truck load-out facility, and haulage of the crushed ore to the HLF;
- Operation of the BRSF and the phase 3 and 4 areas of the HLF which will see both Project components continue to increase in size during this Project phase;
- Lighting of project components, ancillary infrastructure and vehicles; and
- Activities associated with the progressive restoration of the Tigranes/Artavazdes open pit, including the movement of mine vehicles during the backfilling of the open pit with barren rock material from the Erato open pit.

This later operational phase therefore has potential to result in significant, albeit medium-term and, to an extent, intermittent impacts on both landscape and visual receptors.

#### ***Impacts Associated with Lighting during Night Time Hours***

The lighting of Project components, mobile plant machinery and vehicles across the Project-affected area may potentially give rise to visual impacts. These impacts associated with lighting may arise during the construction, operation and closure phases as a consequence of:

- Direct lighting: where light is directly experienced by the receptor, for example a vehicle moving towards a viewer (this will especially be the case for mine vehicles travelling northwards along the main haul road on the west of the mountain where headlights will shine light directly towards the settlements of Jermuk and Kechut);
- Indirect lighting: where the light source is not directed at the receptor but the pool of light from a lighted Project component, or from vehicles will be seen;
- Night glow: impacts arising from lighting which is of sufficient strength from a single or multiple source to be reflected in the atmosphere. Such impacts will be influenced by atmospheric conditions such as fog, low cloud and/or dust particles, which will reflect the light. Conversely on clear nights these impacts may be reduced.

#### ***Potential Impacts: Closure Phase: Years 11 to 14***

Potential landscape and visual impacts resulting during the closure and restoration of the Project will be associated with activities which are visible from outside the Project Footprint, as well as those associated with people and vehicle movements, and the operation of machinery. They will gradually diminish as works are completed, and will include (see also Chapter 3: Project description and pMRCRP; Appendix 8.18):

- Use of access roads by vehicles bringing in workers involved in decommissioning and restoration of the Project-affected area;

- Progressive restoration of the final profile of the Tigranes/Artavazdes open pit, and partial backfill of the Erato open pit;
- Activities associated with the removal of Project components from the landscape, including the building that contains the crushing and screening facility, overland conveyor, ADR plant, ponds, substations, maintenance workshop and facilities, security fencing and ancillary structures such as visible pipework and drainage culverts; and
- Activities associated with the progressive restoration of all other disturbed areas in order to seek to blend altered land forms with those present naturally, and to promote gradual restoration of appropriate native vegetation.
- Night lighting from areas that remain illuminated during darkness and from mobile plant that is operated after night fall (see 6.5.14).

Most remnants of the Project, including concrete and other buried man-made constructions, will be removed, down to approximately 1 m below ground level, but as complete removal will result in large scale disturbance, some elements will be left in place.

The restoration phase therefore has potential to result in significant, albeit medium-term and, to an extent, intermittent impacts on both landscape and visual receptors.

***Potential Impacts: Post-Closure Monitoring Phase: Years 15 to 19***

The assessment of this Project phase is supported by viewpoint visualisations from three representative viewpoints showing the proposed Project at Year 19, following the implementation of all restoration measures and post-closure monitoring. Potential landscape and visual impacts resulting in the long term will be confined to the remnant permanent alteration of the land form. In the absence of restoration, disturbed surfaces could persist for a number of years; however, the implementation of appropriate mitigation measures will help ensure successful landform integration and revegetation.

This phase will last for up to five years with ongoing monitoring undertaken particularly in relation to the gradual return of the slow growing Sub-alpine vegetation which is present across a relatively large proportion of the directly Project-affected area. The recolonisation of the Sub-alpine vegetation zone will require the replication of approaches developed through ongoing studies and trials undertaken throughout the operation phase to be implemented across a much larger area in order for successful revegetation of affected areas. More information on the restoration of vegetation is provided in Chapter 6.11: Biodiversity and

Ecosystems.

Landscape and visual impacts identified during this assessment phase of the Project represent the long-term permanent residual impacts resulting from the Project.

#### **6.5.15 Potential Landscape Receptors**

##### ***Identifying Potential Landscape Receptors***

Six broad Landscape Character Types (LCTs) have been defined and are described in Section 4.3, Landscape and Visual Resources. Potential impacts on landscape receptors will arise from the construction, operation and closure of the Project, as outlined in the previous section.

##### ***Direct and Indirect Landscape Impacts***

Impacts can be direct (i.e. where the components of the Project are located within the LCT, and therefore will directly or physically affect the landscape resource) or indirect (i.e. where components of the Project located outside the LCT may affect the landscape character or views within an adjacent or more distant LCT).

Direct impacts on landscape character are predicted in the areas where the project components will be located, across their physical footprints.

In order to identify potential indirect impacts on landscape character, Zones of Theoretical Visibility (ZTVs) were generated to indicate the extent of theoretical visibility of the Project components across the study area (Figure 6.5.2). The extent of theoretical visibility of the Project components across the landscape types identified within the study area allows potential indirect impacts on landscape character to be identified (Figure 6.5.3 to 6.5.8). Essentially, changes to landscape character will be as a direct consequence of the visible changes experienced from the wider area.

As outlined in Chapter 4.3, there are no areas designated for landscape qualities, such as State Reserves or National Parks located within the study area. No areas outside of the study area, which are designated for special landscape qualities, will be affected by the proposed Project, either directly or indirectly.

Although there are no areas within the study area designated for their specific landscape qualities, a number of Specially Protected Nature Areas, designated for their nature conservation qualities and sensitivities are located within the study area, and are designated

as State Sanctuaries. These State Sanctuaries are listed below and shown on Figure 4.3.5, and are described and assessed in more detail within Section 6.11 Biodiversity.

- Her-her Open Woodland State Sanctuary;
- Jermuk Forest State Sanctuary.

Potential direct and indirect impacts upon the specific landscape character and landscape features, which may contribute to their nature conservation designation as Specially Protected Nature Areas, are considered within the assessment of individual LCTs within which they lie.

Table 6.5.11 outlines the LCTs identified within the study area and the associated nature of potential impacts on the landscape receptors which are considered within the assessment.

<b>Table 6.5.11: Landscape Character Types</b>	
<b>Landscape Character Type</b>	<b>Direct / Indirect Impacts</b>
Settled Lowland and Rocky Gorges (generally found at elevations below 2,000 m asl)	Indirect Impacts
Lower Farmed and Settled Foothills (generally found at elevations of 2,000 - 2,300 m asl)	Direct and Indirect Impacts
Forested Upper Gorge and Foothills (generally found at elevations of 2,300 - 2,500 m asl)	Direct and Indirect Impacts
High Steppe and Plateau Grassland (generally found at elevations of 2,000 - 2,300 m asl)	Direct and Indirect Impacts
Highland Hills and Grazing (generally located at elevations of 2,300 - 2,700 m asl)	Direct and Indirect Impacts
High Rocky Peaks (generally found at elevations over 2,700 m asl)	Direct and Indirect Impacts

### **6.5.16 Potential Visual Receptors**

#### **Identifying Visual Influence**

As outlined in Section 4.3, the process of identifying the extent of visual influence of the Project was informed by generating Zones of Theoretical Visibility (ZTVs).

#### **Zones of Theoretical Visibility**

ZTVs were generated to indicate the extent of theoretical visibility of the Project across the study area (Figure 6.5.2), extending to an area of approximately 15 km radius from the outermost components of the Project, within which significant visual impacts are likely to be contained. The ZTV is based on a bare ground terrain model and therefore illustrates a 'maximum case scenario' with no account taken of screening by vegetation and buildings.

ZTVs were also generated for the following individual Project components:

- Open pit of Erato; (Figure 6.5.3)
- Open pit of Tigranes/Artavazdes; (Figure 6.5.4)
- HLF; (Figure 6.5.5)
- BRSF; (Figure 6.5.6)
- Building that contains the crushing and screening facility; (Figure 6.5.7)
- Overland conveyor. (Figure 6.5.8)

The individual component ZTVs were combined to create a Cumulative ZTV (CZTV) (Figure 6.5.9) showing the relative theoretical visibility of different combinations of the component parts of the Project.

### ***Identifying Potential Visual Receptors***

Section 4.3 provides a brief outline of the potential visual receptors (people) who may experience visibility of the Project, and a change in those views as a result. These receptors (groups of people who may experience changes in their views) are listed below:

- Residential receptors in potentially affected communities (e.g. Gndevaz, Jermuk, Kechut, Saravan, Saralanj, Ughedzor, Gorayk);
- Tourists and visitors (e.g. tourists and visitors in Jermuk);
- Recreational receptors (e.g. users of the Jermuk ski slope);
- Receptors travelling on roads through the study area – including the H-42 and M-2 highways (e.g. road users on the Armenian Silk Road, who may be travelling to or from Iran or travelling to and from Jermuk); and
- Receptors working in the landscape (e.g. seasonal herders, daily herders, agricultural workers and people foraging for food and/or plants from the land).

Receptors located outside the shaded areas of theoretical visibility shown on the ZTVs will not experience views of the main components of the Project and as a consequence, it is predicted that these receptors will not experience visual impacts in relation to these components. In some instances, receptors may experience visibility of minor components of the Project (i.e. those not modelled in the ZTVs) and from some additional viewpoints, and/or visibility of infrastructure and vehicle lighting at night. Additional viewpoint visualisations are included to illustrate these potential views. In addition, visual receptors may experience components of the Project intermittently or sequentially as they move around the area. Intermittent views, seen whilst moving along a road for example, are referred to as sequential impacts.

Table 6.5.12 below indicates where theoretical visibility of the component parts of the Project will be possible from a selection of potentially sensitive locations, which represent those visual receptors outlined above.

Table 6.5.12: ZTV Analysis						
Sensitive Locations	Project Component					
	Erato open pit	Tigranes/ Artavazdes open pit	BRSF	HLF	Buildings that contain crushing & screening facility	Overland Conveyor
Gndevaz	✓	✓		✓	✓	✓
Jermuk	✓		✓		✓	✓
Kechut			✓		✓	✓
Saravan	✓	✓				
Saralanj	✓	✓				
Ughedzor	✓	✓				
Gorayk						
Jermuk Ski Slope	✓	✓	✓		✓	✓
Spandaryan Reservoir	✓	✓	✓			
Armenian Silk Road (M-2)	✓	✓	✓			
H-42 highway (north from M-2 to Jermuk)	✓	✓	✓	✓	✓	✓
Minor road through Vorotan Valley (to its head)	✓	✓	✓			

### ***Identifying Potential Representative Viewpoint Locations***

In order to illustrate the potential views experienced by visual receptors, a number of representative viewpoint locations were identified. These viewpoint locations were identified using the ZTV and in discussion with the Project team, reflecting the potential concerns of communities and statutory authorities, and were verified in the field during field visits in April and June 2013. The locations were reviewed throughout the iterative Project design process to ensure they remained representative of potential views experienced by key visual receptors. An additional viewpoint (Viewpoint 7: H-42 highway south-west of Heap Leach Facility) was identified in October 2013 to represent the views of receptors travelling north on the H-42 highway towards Jermuk from south of the HLF. Three viewpoints (viewpoints 15-17) were identified in October 2015 to illustrate views of the revised project components following value engineering and optimisation process undertaken in 2015.

The selected viewpoints illustrate a variety of different locations which are representative of different visual receptors and were chosen in accordance with the criteria outlined in Chapter 4, Section 4.3.

A total of 17 viewpoints were identified to represent the views experienced by different receptors across the study area; these are generally ordered numerically from the Top of Jermuk Ski Lift (viewpoint 1) in the north, anti-clockwise around the Project-affected area, to Little Erato<sup>6</sup> (viewpoint 14), and finally West of Kechut Reservoir (viewpoint 17). These viewpoints are shown on Figure 6.5.1 and are listed in Table 6.5.13.

<b>Table 6.5.13: Representative Viewpoints</b>				
<b>VP No.</b>	<b>Viewpoint Name</b>	<b>Grid Reference</b>		<b>Approx. Distance from Project</b>
		<b>Easting (E)</b>	<b>Northing(N)</b>	
1	Top of Jermuk Ski Lift	558566	4409466	6.8 km
2	Hotel Olympia, Jermuk	557105	4410044	7.4 km
3	Hotel Armenia, Jermuk	556928	4410153	7.5 km
4	Deer Sculpture, west of Jermuk	556657	4409747	7.0 km
5	Western edge of Gndevaz Village <sup>7</sup>	552765	4401848	2.5 km
6	H-42 highway south of Gndevaz	551961	4398867	4.4 km
7	H-42 highway South-west of Heap Leach Facility	551805	4398323	1.0 km
8	Armenian Silk Road (M-2 highway) near Junction with the H-42 highway	548084	4393759	10.6 km
9	Armenian Silk Road (M-2 highway) in Saralanj village	557307	4395581	4.2 km
10	North end of Ughedzor village	558390	4393710	4.6 km
11	Syunik Gates on the Vorotan Pass (M-2 highway) between Saravan and Goryak	561166	4393305	3.9 km
12	Armenian Silk Road (M-2 highway) between Tsghuk and Gorayk	568877	4392779	8.2 km
13	Minor road through Vorotan valley	562986	4403300	620 m
14	Little Erato (summit of hill)	559564	4401931	50 m
15	Minor road from Gndevaz to Armenian Silk Road	555695	4400977	260 m
16	Jermuk Church	557920	4407279	4.7 km
17	West of Kechut Reservoir	555743	4405611	4.0 km

### 6.5.17 Viewpoint Visualisations

The visualisations which accompany the assessment aim to illustrate representative views of the proposed project. Visualisations may be produced in many forms (hand drawn sketches,

<sup>6</sup> The un-named subsidiary hill, north-west of North Erato, has been referred to as Little Erato for the purpose of this assessment; the hill summit is centred on approximately E 559600, N 4402000.

<sup>7</sup> The western edge of Gndevaz represents the area of the settlement from which potential visibility of the Project components will be possible.



annotated photographs, photomontages), however they will never be exactly true to life. Visualisations are tools that may inform an assessment of visual impacts, and their application therefore requires careful use. It is important therefore to note that computer generated images, including ZTVs, wireframes and photomontages are used as tools to provide an illustration of the potential visual impacts. They are not a substitute for the actual review of likely visual changes in the field, which forms a key part of the assessment methodology.

The methodology for production of the visualisations was based on good practice guidelines contained within applicable guidance<sup>1,8</sup>. Further information about the approach is provided in the next section. The referenced documents also provide guidance for the correct use and viewing of visualisations and should be read prior to their use.

### ***Viewpoint Photography***

The camera used for viewpoint photography was a Nikon D7000 digital SLR with a fixed at 35 mm focal length lens (equivalent to a 52.5 mm focal length lens on a 35 mm film camera), except where otherwise stated. A tripod with vertical and horizontal spirit levels was used to provide stability and to ensure a level set of adjoining images. A panoramic head was used to ensure the camera rotated about the no-parallax point of the lens in order to eliminate parallax errors between the successive images and enable accurate stitching of the images. The camera was moved through increments of 15° and rotated through a full 360° at each viewpoint. Twenty four photographs were taken for each 360° view. This enabled a 90° angle, centred on the view towards the proposed development, to be cut from the overall 360°.

The location of each viewpoint was recorded in the field using a handheld GPS. Weather conditions and visibility were considered an important aspect of the field visits for the photography. Where possible, viewpoint photography was undertaken on clear days with good visibility during field visits in April, June and November 2013. The photography taken during the two initial site visits provided photography representative of winter (April) and summer (June) seasonal conditions. Viewpoint photography for viewpoint seven was undertaken in November 2013, in autumnal conditions, and subsequent photography was undertaken in November 2015 for viewpoint 15. Viewpoint locations were visited at appropriate times of day to ensure, as far as possible, that the sun lit the scene from behind, or to one side of the photographer. Photographs facing into the sun were avoided where

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<sup>8</sup> *Advice Note 01/11: Photography and photomontage in landscape and visual impact assessment* (2011) Landscape Institute

possible to prevent the Project-affected area appearing in silhouette. Adjustments to lighting of the Project-affected area were made in the rendering software, to suit the particular lighting and atmospheric conditions present at that time, and ensure that the Project components appeared realistic in the view.

### ***Photograph Stitching, Wireframes and Photomontages***

Photograph stitching software (Photoshop) was used to stitch together the adjoining images. Topos R2 (43D) software was used to view the development from selected viewpoints in model format. A default viewer height of 2 m above ground level was used for each viewpoint. Wireframe model views were overlaid onto the pre-prepared 90° stitched photography in order to accurately render the Project components into each view.

All views from viewpoints have been represented using baseline photography showing the existing views, wireframe model images showing the proposed components of the Project on a bare ground terrain model, and fully rendered photomontages, illustrating the proposed components of the Project integrated into the baseline photography, in accordance with good practice guidance.

The presentation of fully rendered photomontages involved a number of additional stages. The Topos R2 (43D) software was used to accurately reproduce the geometry of the site and also take account of the sunlight conditions and the position of the sun in the sky at the time the photograph was taken. Fixed features on the ground were used as markers to help line up the image extracted from the ground model with the baseline photography. The final stage required the rendered development to be blended into the actual view. This was carried out using Photoshop software and allowed the Project components to be located within the context of the existing elements that appeared in the baseline photography.

Each viewpoint is illustrated by the following; the original baseline photography from the viewpoint, a wireframe image and a photomontage at a 90° angle of view. Although this arrangement is less than the recommended image height and viewing distances<sup>9</sup> set out by good practice guidance, the additional horizontal view information is included to provide context of the surrounding landscape. Additional images are also provided illustrating a 50° included angle. These are at image heights and viewing distances above the minimum recommended by good practice guidance.

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<sup>9</sup> Viewing distance is the distance at which the image should be viewed to provide a representation of the 'real life view'.

From a small number of the representative viewpoints it will be possible to experience visibility of the proposed Project components through a wider angle of view than 90°. Where visibility extends beyond the 90° angle of view, a series of 90° and accompanying 50° visualisations have been included to illustrate views of the Project from these viewpoint locations.

### ***Operations Phase: Year 10 - Maximum Case Scenario Visualisations***

The photomontages for each representative viewpoint show the likely visual changes experienced during the Operations Phase Year 10 – Maximum Case Scenario as this phase represents the greatest predicted change in views and visual amenity, and illustrates the likely most significant visual impacts to be experienced during the life of the Project.

### ***Seasonal Visualisations***

The majority of viewpoints are illustrated by summer season (June) baseline photography and photomontage visualisations, however from five representative viewpoints, baseline photography and photomontage visualisations during winter based seasonal conditions (April) are also included to illustrate the potential variations in visual impact experienced during the winter season, when the landscape is predominantly covered by snow.

### ***Post-Closure Monitoring Phase Visualisations***

Six viewpoints are illustrated by photomontage visualisations illustrating the likely visual changes experienced at the end of the Post-Closure Monitoring Phase: Year 19, when all closure activities, post-closure restoration measures and monitoring have been completed. These photomontage visualisations therefore represent the long-term permanent residual impacts of the proposed Project following completion, and a point in time at which the restoration of vegetation across disturbed areas will be reasonably well advanced.

### ***Night Time Visualisations***

In order to illustrate the potential visual impacts at night, two viewpoint locations are illustrated with night time photography taken after dusk during field work in April 2013. The baseline photography from these two locations indicates the existing lighting present across the Project-affected area and the surrounding landscape. Due to the uncertainty in the requirements for lighting and detailed design of the Project components, photomontages illustrating the potential visual impact of night time lighting do not accompany this assessment. Nevertheless, consideration of potential visual impacts arising from the expected lighting of key Project components and vehicle movements across the Project-affected area is included within the assessment of visual impacts. Essentially, all of the Project-affected area

is unlit, and so all lighting which will be introduced will be as a consequence of the Project.

Table 6.5.14 below outlines the representative visualisations which accompany each of the 14 representative viewpoints within the visual assessment:

<b>Table 6.5.14: Representative Visualisations</b>					
<b>VP No.</b>	<b>Viewpoint Name</b>	<b>Baseline Photography &amp; Maximum Case Scenario Visualisation</b>		<b>Post-Closure Monitoring Phase Visualisation</b>	<b>Night Time Baseline Photography</b>
		<b>Summer</b>	<b>Winter</b>		
1	Top of Jermuk Ski Lift	✓	✓		
2	Hotel Olympia, Jermuk	✓		✓	
3	Hotel Armenia, Jermuk	✓		✓	
4	Deer Sculpture, west of Jermuk	✓	✓		✓
5	Western edge of Gndevaz Village <sup>10</sup>	✓	✓		✓
6	H-42 highway south of Gndevaz	✓		✓	
7	H-42 highway South-west of Heap Leach Facility	✓		✓	
8	Armenian Silk Road (M-2 highway) near Junction with the H-42 highway	✓			
9	Armenian Silk Road (M-2 highway) in Saralanj village		✓		
10	North end of Ughedzor village	✓			
11	Syunik Gates on the Vorotan Pass (M-2 highway) between Saravan and Goryak	✓			
12	Armenian Silk Road (M-2 highway) between Tsghuk and Gorayk	✓			
13	Minor road through Vorotan valley	✓		✓	
14	Little Erato	✓		✓	
15	Minor road from Gndevaz to Armenian Silk Road <sup>11</sup>	✓			
16	Jermuk Church <sup>11</sup>	✓			
17	West of Kechut Reservoir <sup>11</sup>	✓			

### 6.5.18 Design and Mitigation Measures

#### Mitigation Measures

Mitigation measures will be incorporated into the Footprint Management Plan (FMP, Appendix 8.8) and by a requirement of the contract documents as appropriate. Measures such as 'hold points' for inspection or agreement will be utilised in order that tests and

<sup>10</sup> The western edge of Gndevaz represents the area of the settlement from which potential visibility of the Project components will be possible.

<sup>11</sup> Baseline photography and wireline visualisation only

samples (i.e. use of specific materials, colours and finishes to componentry) can be used to demonstrate measures before being rolled out across the Project-affected area as a whole.

The successful implementation of these will be monitored and advised by an Environmental Clerk of Works.

Wider landscape and habitat enhancement, to be implemented in the early years of the project, will be developed and agreed in consultation with Lydian, landowners and statutory consultees before construction commences on site. These measures will be developed in conjunction with sensitivity maps and form a part of the commitments discussed in Chapter 8.

The pMRCRP is in a preliminary format (see Appendix 8.18), within which a detailed landscape restoration plan will be prepared. The landscape and ecological mitigation and restoration measures are described in this section and will be further developed and agreed in consultation with statutory bodies and Lydian before construction commences on site.

### ***Mitigation by Design***

The mitigation of potential landscape and visual impacts is embedded within the iterative Project design development process (see Chapter 5), whereby the location and design of Project components was devised, as far as practical given the location of the mineral reserves, in order to reduce and/or avoid direct or indirect landscape impacts and reduce and/or avoid visual impacts upon identified receptors.

The location, design and integration of the Project-affected area and components into the existing landscape and views was undertaken, where practical, to help reduce the magnitude of potential landscape and visual impacts that will result from the Project. As such the objective is to create final landforms with naturalistic and sympathetically designed landscape profiles as far as is practicable.

The phasing of the Project is designed to allow progressive reclamation and rehabilitation of Project components as extraction is undertaken and completed, so that bare unvegetated areas can be kept to a minimum, and so that stored topsoil and vegetation can be replaced on graded areas as operations are completed.

The HLF has been designed so that the ultimate finished landform will tie in with surrounding natural slopes in so far as is possible. Design iterations of the HLF were undertaken to integrate

the facility into the surrounding topography, where it occupies a natural sequence of valleys in the landscape, which will help to reduce the zone of potential visual influence, including from a number of sensitive locations; the settlements of Jermuk, Kechut and Gndevaz, and minimise visibility where possible from the H-42 highway between the Armenian Silk Road (M-2 highway) and Jermuk.

The location, layout and design of the Project components, associated buildings, infrastructure and ancillary componentry, including their aggregation, shape, and the texturing and colouring of external surfaces has been designed to help reduce the magnitude of the impacts that will result from the Project:

- Where project components are located in prominent positions which break distinguishable skylines or ridges, detailed design will seek to mitigate these impacts through their reconfiguration or alternations in their form (i.e. reduction in vertical height), to ensure best fit with surrounding landscape and in order to minimise more widespread visual effects wherever possible;
- External clutter will be reduced by enclosing Project components and containing them within simple buildings which fit and respond to the localised topography, as far as practicably possible;
- Low level clutter around the Project components, including the ADR plant, offices, and worker accommodation buildings; will be screened by vegetated topsoil bunds and topsoil storage stockpiles;
- Muted colours appropriate to the natural landscape will be considered for external building and component surfaces, which will blend into the surrounding landscape and which will not contrast or stand out when viewed from distant locations.
- Non-reflective surfaces will be used wherever feasible;
- Windows in buildings will, where possible, be shuttered to prevent light spill at night. There will be minimal security lighting in external areas (sensors will be used to ensure it does not get left on); and
- The construction of berms alongside access and haul roads to reduce light spill from vehicle headlights at night, and especially during the extended hours of darkness during the winter months.

At the detailed design stage, it is envisaged that further mitigation will be incorporated into the design of the Project components to ensure the landscape and visual impacts do not exceed the residual impacts identified in this assessment.

The following mitigation measures will be implemented to reduce the potential impacts resulting from the Project and associated workings' during the construction, operation and production, closure and post-closure monitoring phases of the Project, including the implementation of progressive restoration throughout the life of the Project.

### ***Construction Phase Mitigation***

Measures will be detailed in the Environmental and Social Management Plan (ESMP) (see Chapter 8) which identifies the policies and procedures that will be adhered to by Lydian, Geoteam and all contractors engaged for the Project. The ESMP includes an ESIA Commitments Register (CR, see Appendix 8.5) along with management plans that apply to the life cycle of the Project. The following mitigation measures will be implemented throughout the construction phase to ensure landscape and visual impacts are reduced or avoided:

- Construction vehicles will primarily access the Project-affected area from the west via the H-42. All heavy traffic will be required to use two defined Project access roads. Light vehicles may use secondary access roads (see Chapter 6.19: Transport);
- Construction vehicles will not track across undisturbed areas outside their defined working area and access corridor;
- Materials and machinery will be stored tidily during the works. Machinery will not be left in place for longer than required for construction purposes, in order to minimise its visual impact on views;
- Contractors compounds and storage areas will be located away from sensitive receptors as far as possible;
- Reclamation of exploration works (drilling pads, access roads) will be ongoing during the construction phase to restore and revegetate previously disturbed areas, which will not be affected by the operations phase of the Project. This will include redundant access roads and drill sites, provided they are not within the planned mine facilities;
- The worker accommodation camp area, laydown and storage areas will be located away from visible areas as far as possible;
- The location of worker accommodation camp area, laydown areas and site offices will be designed at the detailed design stage to take account of natural screening provided by topography and existing landforms;
- Topsoil, and the seedbank within it, will be carefully stripped from all construction areas, including the base of the HLF and BRSF and will be stored in areas where it will not be disturbed or tracked upon, in low uncompacted mounds. Stored topsoil will be

- used for the progressive restoration of disturbed areas. Soft materials will be used to grade slopes prior to promotion of natural recolonisation of vegetation;
- Regular looking engineered profiles will be avoided where practical. Irregular concave and convex slopes mimicking existing contours, which match with the scale of the existing hill slopes, will be created as far as possible during construction and restoration of the BRSF, HLF and necessary ground works for built components of the Project;
  - Wherever possible slopes will be designed and engineered so that long-term visible man-made rock slope reinforcement measures are not required or can be entirely covered with turves and revegetated. Any reinforcement that is required will endeavour to use appropriate geotextiles, preferably of natural material;
  - Localised grading of selected sections of track cutting slopes, embankments and sides will be undertaken. Scarred track sides, slopes and tie-ins will be rounded to concave or convex profiles, and where available, topsoil/turves will be placed upon them, to encourage regeneration of vegetation;
  - Seeding will be undertaken using locally native species or culturally appropriate plants, and to tie in with adjacent vegetation types, where considered appropriate and essential to prevent erosion;
  - On completion of the construction phase, all equipment and temporary installations, buildings, etc. not required for future operational use will be dismantled and removed;
  - Removal of construction waste and its appropriate disposal;
  - Filling and compacting of pits, hollows and excavation trenches with the appropriate stockpiled materials;
  - Slope regrading activities will be undertaken to provide sustainable and erosion resistant landforms compatible with the post-closure land use and water management strategies;
  - Exposed soil and overburden slopes will be regraded so that they conform with adjacent landform, in order to achieve the mine Reclamation, Closure and Rehabilitation design criteria.

Progressive reclamation of exploratory works (drilling pads, access roads) will also be undertaken during the construction phase to restore and revegetate previously disturbed areas which will not be affected by the operations phase of the Project. This includes redundant access roads and exploratory drilling sites, provided they are not within the planned mine facilities.



Further exploratory works will be ongoing throughout the construction phase, and into the operation phases of the project, with progressive restoration undertaken as exploration activities are completed and activities move to new locations within the Project-affected area.

### ***Operation and Production Phase Mitigation***

The following mitigation measures will be implemented throughout the operation phases to ensure landscape and visual impacts are avoided or reduced:

- As each phase of operation is completed, it will be restored by shaping and grading to make these slopes match in with surrounding natural contours; treating the edges of the slopes in particular, so that scarred and eroded tie-ins are avoided, and placing soil onto slopes and ledges to promote recolonisation with appropriate natural vegetation;
- Vehicular access to the Project-affected area will be minimised. The majority of workers will arrive on site via bus and limited car parking will be available for employees within the extents of the Project main area;
- The mine and the surrounding area will be maintained in a clean and uncluttered state: the pMRCRP (Appendix 8.18), FMP (Appendix 8.8) and ESMP (Chapter 8) will include landscape and habitat management requirements;
- Spoil mounds of topsoil and soft overburden materials will be established on the periphery of the working areas of Project components and will be seeded and grassed to reduce visual impacts from receptors west and north of the Project-affected area.
- Screening, including the use of berms, will be located where feasible to the outer edge of haul roads, access roads to reduce the visual impact of mobile plant including the mitigation of the perceptibility of artificial lighting sources such as flood lighting on buildings and vehicle movements along access and haul roads, in particular mitigating the residual effect of headlights of mine vehicles on receptors in Jermuk and Kechut when travelling northwards along the on-site haul road around the western flanks of the mountain;
- Backfilling of the Tigranes/Artavazdes open pit and partial backfilling of the Erato open pit will be undertaken. The outer edges of the open pit excavation areas will be restored through the breaking down of the upper bench and 'roll over restoration', making use of the spoil storage mounds as screening, to lessen the visual contrasts and establish vegetation across the disturbed land.

In addition:

- Tree nurseries have been created in local villages to grow trees for transplantation to

the Project-affected area and adjacent areas both to provide screening of visual impacts from Project components and for landscape enhancement.

- Opportunities for further localised screening and tree planting will be included in the detailed construction plans and included as commitments in the pMRCRP (Appendix 8.18).

### ***Mitigation of Night Time Lighting***

The introduction of night time operation and production activities will potentially result in visual impacts where views of the various working components may occur, arising from the lighting of Project components and headlights of mobile plant machinery and vehicles on site. The following mitigation measures will be implemented throughout the construction and operations phases to ensure visual impacts associated with lighting are reduced or avoided:

- Contractors will be requested to use lowest emission lighting that will still provide sufficient light for safety purposes. Low visibility spectrum lights and appliances (full cut-off fixtures that emit no light above the light's horizontal line) will be preferred on mine components, with lighting mounted at the minimum necessary safe height and shrouded where appropriate;
- Lighting will be carefully enclosed within buildings so as not to contribute to light pollution/ light spillage off site/ glare to the sky. Shutters will be used during darkness. There will be minimal security lighting in external areas (sensors will be used to ensure it does not get left on);
- Lighting of work sites will be restricted to agreed working hours and that which is necessary for security. Light sources for night-time construction and operation activities will be pointed downward and away from sensitive receptors such as nearby communities (without forgoing safety purposes);
- Vehicle and mobile plant machinery operators and drivers will be instructed in the appropriate use of headlights (high and low beams) to reduce impacts on visual receptors within local communities close to the Project-affected area. Work in areas in the direct view of sensitive receptors (settlements/residential properties) will be avoided at night and/or lighting will be directed away from these locations, where practical;
- Work in areas in the direct view of sensitive receptors (settlements/residential properties) will be minimised at night where practical;
- Opportunities for further localised screening and tree planting will be included in the detailed construction plans and included as commitments in the pMRCRP (see Appendix 8.18).

### ***Closure Phase Mitigation***

Once the operation and production phases of the Project cease, the closure of all Project components will begin with the removal of all temporary Project components and will be followed by the restoration of the Project-affected area. This phase will be carried out in accordance with the detailed proposals outlined in the pMRCRP (see Appendix 8.18):

- All defunct machinery, clutter, fencing and man-made objects will be removed from the Project-affected area;
- Redundant ponds will be removed;
- Haulage, stockpiling and monitoring of growth media and subsoil layers, to serve as a visual screen during construction, a seed bank and to use for revegetation at closure;
- Provision for collection of species, storage, and reinstatement of vegetation communities from and to areas during the entire length of the Project;
- Progressive rehabilitation of affected areas, where possible, throughout the mine life;
- Removal or redistribution of temporary buildings and structures once their purpose has been fulfilled;
- Re-profiling and regrading of the BRSF, HLF, access roads, haul roads and the open pit areas, when no longer required as part of operations;
- Cutting and embankment slopes will be graded to tie in with existing natural slopes, and sharp edges will be avoided, except where minor rock or scree faces may be considered appropriate;
- The profiled faces of the HLF and BRSF, their top surface, as well as any remaining spoil heaps and horizontal breaks (vehicle access berms and more minor footways) at completion of the operational phase will be designed to tie into existing contours, so that slopes match in with surrounding natural contours - using available materials as fill to soften angles and create a rolling profile. Shaping and grading of the completed faces will be implemented prior to seeding or the placement of turves to promote natural recolonization of vegetation;
- The edges of the slopes will be treated, so that scarred and eroded tie-ins are graded out. Layers of topsoil will be placed in the correct stratigraphic order back onto the surface to promote recolonization with appropriate native vegetation;
- The outer edges of the open pit excavation areas will be restored through the breaking down of the upper bench and 'roll over restoration' making use of the spoil storage mounds for screening, to lessen the visual contrasts and establish vegetation across the disturbed land;

- Surfaces with significant compaction or degradation will be scarified or contour ripped to promote revegetation, and any overburden that was excavated will be pushed, raked or pulled back over the area. Any redundant access tracks will be ripped and windrows back-graded. Stockpiled topsoil and vegetation will be re-spread over the sites and any sumps will be backfilled;
- Storage and removal of hazardous and domestic wastes;
- Engineering and revegetation of slopes to provide erosion resistant and sustainable landforms;
- Revegetation of disturbed areas for compatibility with the selected post-mining land use, prioritising native species and vegetation types that existed before the mining operation began and species which are culturally relevant;
- Revegetation will be encouraged so as to soften the appearance of the HLF, ADR and pond faces and to integrate both the natural and manmade land forms, and the new areas of vegetation; and
- Opportunities for further localised screening and tree planting will be included in the detailed construction plans and included as commitments in the pMRCRP (see Appendix 8.18).

#### ***Post-Closure Monitoring Phase Mitigation***

Following the implementation of the closure mitigation measures outlined in the pMRCRP (see Appendix 8.18), ongoing post-closure monitoring will be undertaken for a period of five years, from the start of closure activities, to ensure that restoration and rehabilitation of revegetation and enhancement landscape works and planting is successful.

- Monitor restoration and manage according to ongoing landscape and habitat management actions that will be detailed in the Biodiversity Management Plan (BMP, Appendix 8.21) and pMRCRP (Appendix 8.18), so as to promote complete and successful regeneration (it will be appropriate to retain some areas as bare mineral/rock/scree surfaces as part of the mosaic);
- Ongoing specialist supervision of vegetation recovery will be required to ensure the efficiency and effectiveness of revegetation and enhancement planting.

#### ***6.5.19 Assessment of Residual Landscape Effects***

The baseline section in Section 4.3 identified six broad landscape character types (LCTs) within the study area. Each of these LCTs varies relative to its susceptibility to change and the existing value attached to the landscape. The following section outlines the residual impacts of the Project on LCTs or potential landscape features and resources contained within those

LCTs.

Impacts can be direct (i.e. where the components of the Project are located within the LCT, directly or physical affecting the landscape) or indirect (i.e. where the components of the Project located outside the LCT may affect the landscape character or views within an adjacent or more distant LCT through intervisibility).

Landscape impacts on LCTs defined within the study area are outlined in the tables which follow (Table 6.5.15 to Table 6.5.20). The assessment should be read with reference to the map of Landscape Character Types (Figure 4.3.5). Each table provides the following information:

- Project components within LCT;
- Representative viewpoints located within LCT;
- Extent of visibility across the LCT;
- Sensitivity of landscape receptor;
- Description of landscape changes;
- Magnitude of landscape impact; and
- Significance of the landscape effect.

The magnitude of landscape impact and significance of landscape effects was assessed for each phase of the Project defined within Table 6.5.10 and assumes implementation of the mitigation measures outlined earlier in this section.

**Table 6.5.15: Settled Lowland and Rocky Gorges (below 2,000 m asl)**

<b>Project Components within LCT:</b> No Project components within LCT	<b>Representative Viewpoints located within LCT:</b> Illustrated by viewpoints 6, 8, 9, 17	
<b>Extent of Visibility across LCT:</b> Visibility of the Project components from this LCT will be possible from east and north facing slopes on the edge of the Arpa and Darb River gorges where visibility of Project components will be limited to the open pits along the craggy ridge of Amulsar Mountain, and views of the HLF, building that contains the crushing and screening facility, overland conveyor, ADR plant and ancillary infrastructure, and other minor Project components located on the west and north facing foothills. To the south-west of the Project-affected area, visibility of these components of the Project. Including the open pits will be possible from the settled and farmed lowland areas which lie to the east of the steep sided Arpa River gorge.		
<b>Sensitivity of Landscape Receptor:</b> The settled, scenic and occasionally intimate nature of this LCT means it is judged to be sensitive to the introduction of large scale development and susceptible to changes in its underlying character as a result. The gorge landscapes which attract tourists and visitors are deemed most sensitive to landscape change, where glimpsed and framed views to the surrounding upland summits and ridges are a key characteristic. The LCT also includes areas covered by the <b>Her-her Open Woodland State Sanctuary – Specially Protected Nature Area</b> , judged to be of <b>high</b> landscape sensitivity. The sensitivity of this LCT as a whole to the landscape changes proposed is therefore judged to be <b>medium</b> .		
<b>Description of Landscape Impacts:</b> This LCT will not be directly affected by the components of the Project; however the H-42 highway which passes through the LCT will form the main public access to the Project-affected area and will experience an increase in traffic throughout the life of the project. During construction, intervisibility with Project components will be available from the valley and plateau areas, and the western slopes of the Arpa River Gorge. As operation begins the HLF, ADR plant, building that contains the crushing and screening facility and overland conveyor will become intervisible with areas of this landscape out with the main gorge, and introduce additional built development within close proximity to the LCT. The indirect impacts of dust created from Project components and vehicle movements may be perceptible along the cultivated valley along the route of the H-42 highway during the construction and operation and production phases. These impacts will be reversible and will only occur under certain weather conditions. The gorge landscape of this LCT will experience no or very limited intervisibility of the Project components, which are unlikely to affect the scenic qualities and key characteristics of the landscape. Views from the lowland plateau and valleys to the distant mountain summits and ridges, which are characteristic of this LCT, will be affected by the removal of the Tigranes, Artavazdes and Erato mountain peaks and creation of the open pits and haul road on the western flanks of the mountain ridge. Although visibility of landscape changes across areas of adjacent LCTs will be possible from this LCT, the changes will form a small part of the available views, seen at a distance and often visible from a relatively small geographical area of this LCT. These changes will be more perceptible throughout the operation and production phases of the Project and will reduce following the implementation of post-closure restoration and monitoring measures. The irreversible changes to the mountain skyline of Amulsar as a result of the Project will lead to long-term irreversible changes in the views experienced from areas of this LCT. Impacts on the landscape character of areas of relict open yew woodland and remnant pear orchards which are characteristic of this LCT and the <b>Her-her Open Woodland State Sanctuary – Specially Protected Nature Area</b> , are judged to be barely perceptible.		
<b>Assessment Phase:</b>	<b>Magnitude of Landscape Impacts:</b>	<b>Significance &amp; Direction of Landscape Effects:</b>
Construction Phase: Year -1	Barely perceptible	<b>Negligible</b> adverse (not significant)
Operations Phase: Year 3	Low	<b>Minor</b> adverse (not significant)
Operations Phase: Year 10 – Max. Case Scenario	Low	<b>Minor</b> adverse (not significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> neutral (not significant)

**Table 6.5.16: Lower Farmed and Settled Foothills (under 2,000 m asl)**

<b>Project Components within LCT:</b> HLF, ADR plant, overland conveyor, site offices, collection ponds, access tracks located within LCT		<b>Representative Viewpoints located within LCT:</b> Illustrated by viewpoints 5, 7, 10, 11, 15
<b>Extent of Visibility across LCT:</b> Visibility of the Project components across this LCT will be possible to the west, south-west and north-west of the Project-affected area. Views are limited to elevated slopes facing the Project-affected area, of which many to the west of the Arpa River gorge and south of the Darb River are wooded. Across the localised area of the LCT, which covers the western foothills of Amulsar Mountain, visibility will be widespread, with numerous Project components visible across the farmed and settled landscape.		
<b>Sensitivity of Landscape Receptor:</b> This LCT already shows evidence of man-made features and extensive landscape change through settlement, agriculture, industry and remnants of mineral extraction. Views from the often open landscape to the higher summits and ridges of Amulsar Mountain are a key characteristic experienced by receptors travelling through or concentrated within the LCT. The expansion of built development within the outer extents of this LCT could further expand the influence of man-made features to adjacent LCTs. The <b>Her-her Open Woodland State Sanctuary – Specially Protected Nature Area</b> is located predominantly within this LCT to the west of the Arpa River Gorge, extending into adjacent LCTs to the north and east. It is protected for its areas of relict open yew woodland and remnant pear orchards. The sensitivity of this designated area to the landscape changes proposed is therefore judged to be <b>high</b> . Overall the sensitivity of this LCT to the proposed landscape changes is therefore judged to be <b>medium</b> .		
<b>Description of Landscape Impacts:</b> This LCT will experience direct landscape changes from the construction of the HLF, ADR Plant, overland conveyor, water treatment plant, collection ponds and access tracks. These components will require extensive earth works, resulting in the removal of existing vegetation, manipulation of existing landform, rerouting of natural drainage and the loss of landscape features such as small river valleys and rocky outcrops, some scattered trees and semi-natural grassland vegetation. These large scale changes will be experienced over a relatively large geographical area of the LCT, between the Arpa River Gorge to the west and Amulsar Mountain to the east, however the changes will be localised when considered within the full extent of the LCT across the study area. Impacts from dust created by Project components and vehicle movements will directly affect the LCT, leading to wider scale impacts than those of the component parts and directly disturbed working areas. The changes resulting from many of the Project components will be reversible following closure and restoration of the Project main area, however long-term impacts from the change in landform and vegetation cover across the HLF site will be irreversible, leading to changes in the key characteristics of the LCT across a localised area, which is unlikely to be suitable for arable agriculture or grazing of animals in the long-term. The direct landscape changes which will occur within this LCT as a result of the Project will be visible across a much larger area of the LCT to the south-west and west of the Project main area. Views of the open pits and other Project components will also be possible from areas of this LCT west of the Arpa River Gorge, affecting the open views to the upland landscape which are characteristic of this LCT. The <b>Her-her Open Woodland State Sanctuary – Specially Protected Nature Area</b> will not experience direct landscape impacts upon the relict open yew woodland and remnant pear orchards as a result of the Project and indirect landscape impacts are considered unlikely to affect the attributes which are reasons for designation of this area. Therefore the impact on the landscape this area is judged to be barely perceptible.		
<b>Assessment Phase:</b>	<b>Magnitude of Landscape Impacts:</b>	<b>Significance &amp; Direction of Landscape Effects:</b>
Construction Phase: Year -1	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 3	High	<b>Major</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	High	<b>Major</b> adverse (significant)
Closure Phase: Year 14	High	<b>Major</b> adverse (significant)
Post-Closure Monitoring Phase: Year 19	Moderate	<b>Moderate</b> neutral (significant)



**Table 6.5.17: Forested Upper Gorge and Foothills (elevations of 2,300 - 2,500 m asl)**

Table 6.5.17: Forested Upper Gorge and Foothills (elevations of 2,300 - 2,500 m asl)		
Project Components within LCT: Existing Project access track within LCT		Representative Viewpoints located within LCT: Illustrated by viewpoints 1, 2, 3 ,4,
<b>Extent of Visibility across LCT:</b> Visibility of the Project from this LCT will be limited to views experienced from the elevated slopes and valley sides to the north of the Project-affected area. The central area of the LCT which includes the settlement of Kechut, Kechut reservoir and the southern extents of Jermuk will experience limited visibility of the Project-affected area due to the intervening topography of the Highland Hills to the south. Visibility from the floor of the gorge around the settlement of Kechut and Jermuk will be possible, with long distance views of the building that contains crushing and screening facility, facilities platform, mine access roads, the BRSF, the Erato open pit and smaller components of the Project visible at a distance of approximately 10 km.		
<b>Sensitivity of Landscape Receptor:</b> This LCT has been subject to extensive landscape change from human influence and built development, which is predominantly focused in the foot of the gorge around the settlements of Jermuk and Kechut, and the nearby Kechut reservoir. The LCT also includes areas covered by the <b>Jermuk Forest State Sanctuary – Specially Protected Nature Area</b> , judged to be of <b>high</b> landscape sensitivity. Overall this LCT is sensitive to development located on the high summits and ridges which form the focus of views out of the LCT. Therefore the sensitivity of this LCT to the landscape changes proposed is therefore judged to be <b>high</b> .		
<b>Description of Landscape Impacts:</b> The existing site access track between the H-42 highway east of Kechut and the exploration camp crosses an area of this LCT. The access track follows the route of an existing minor road through the Vorotan Valley which links Jermuk with the M-2 highway near Gorayk. Grading of this road and the creation of berms along the road edges will increase the area of direct impacts upon the LCT, and the fallout of dust from moving vehicles accessing the Project affected area will extend the visible area of disturbance wither side of the access track, especially in winter, when the access track will become more perceptible across a wider geographical area. The direct landscape impacts arising from the Project will however be relatively small scale and will be reversible following closure, restoration and post-closure rehabilitation Indirect impacts will be limited to long distance views of the Project components (Erato open pit, the building that contains the crushing and screening facility, overland conveyor and the BRSF from the elevated areas of the LCT which form the watershed of the Arpa River, north, east and west of Jermuk. The LCT displays widespread human influence from the presence of built development, linear features (tracks, roads and high voltage overhead transmission lines) and remnants of past industrial activity. The introduction of the Project components will form relatively small scale changes in views experienced from this LCT, however the Project components will be more perceptible in views towards the mountain summits and ridges in late winter and spring (i.e. when fresh snowfall is less frequent), when dust from operations could result in some local discolouration (greying/yellowing) of the snow fields, potentially accentuating the perceptibility of the Project footprint during these periods. Following closure and restoration, most impacts will be reversible; however the long-term changes to the mountain summits and ridges will remain and be perceptible from areas of the LCT. The existing Jermuk and Kechut waste dump is located within this LCT, along the route of the access track. It is proposed that a municipal landfill site will be created within an area of existing borrow pit extraction to the south-east, along the route of the access track. Impacts on the landscape of the steep forested slopes and wooded gorges which are characteristic of this LCT and the <b>Jermuk Forest State Sanctuary – Specially Protected Nature Area</b> , are judged to be barely perceptible.		
Assessment Phase:	Magnitude of Landscape Impacts:	Significance & Direction of Landscape Effects:
Construction Phase: Year -1	Low	<b>Minor</b> adverse (not significant)
Operations Phase: Year 3	Low	<b>Minor</b> adverse (not significant)
Operations Phase: Year 10 – Max. Case Scenario	Low	<b>Minor</b> adverse (not significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Barely perceptible	<b>Negligible</b> neutral (not significant)



**Table 6.5.18: High Steppe and Plateau Grassland (elevations of 2,000 - 2,300 m asl)**

Table 6.5.18: High Steppe and Plateau Grassland (elevations of 2,000 - 2,300 m asl)		
<b>Project Components within LCT:</b> Existing access roads	<b>Representative Viewpoints located within LCT:</b> Illustrated by viewpoints 13, 14	
<b>Extent of Visibility across LCT:</b> Visibility of the Project across this LCT will be widespread throughout the Vorotan valley and plateau grassland north of Spandaryan reservoir. Specific components, including the BRSF and existing access road will be perceptible from the northern extents of the LCT within the Vorotan valley, to the east of the Project-affected area. From the southern extents of the LCT, visibility will be limited to changes in the skyline from the creation of the open pits across the linear ridge of High Rocky Peaks which form Amulsar Mountain above.		
<b>Sensitivity of Landscape Receptor:</b> The northern extents of this LCT are relatively undeveloped and free of extensive human influence, however an existing small scale hydro power dam is located in the upper reaches of the Vorotan Valley, and to the south remnants of industrial development, existing electricity transmission lines and settlement (Gorayk and Tsghuk) along the route of the Armenian Silk Road (M-2 highway) and adjacent to Spandaryan reservoir form key features of the LCT. Overall the openness and relative perceived naturalness of the Vorotan valley means the sensitivity of this LCT to the landscape changes proposed is therefore judged to be <b>medium</b> .		
<b>Description of Landscape Impacts:</b> This LCT will experience very little direct landscape impacts as a result of the introduction of the Project components, whereby the existing access road will form the only project component located within the LCT. However, project components located within relative close proximity in adjacent LCTs may result in impacts from dust during both the construction and operations phases of the Project components, which may increase the perceptibility of the working areas during the late winter/early spring months as the adjacent snow fields become discoloured as the frequency of the regular covering with fresh snow decreases later in the season. The BRSF will be visible from the LCT on the upper flanks of Amulsar Mountain to the west. During construction of these components, removal of vegetation, extensive earthworks, vehicle movements and the introduction of man-made elements will be visible from across the upper Vorotan Valley, which will increase the level of human influence perceptible from this LCT. As operations begin the open pits and movement of barren rock material to the BRSF will result in further impacts upon the key characteristics of the LCT, as the profile of the rocky peaks of Amulsar Mountain are changed following the irreversible removal of the mountain peaks to create the open pits. The sense of remoteness and solitude will be altered as operational activities are undertaken. These activities will become increasingly perceptible from this LCT during the operational phases as material is extracted from the open pits and the BRSF increases in size. Following closure restoration will be undertaken across the disturbed areas including the reprofiling of the open pits and immediate surrounding areas and post-closure activities to grade and revegetate the BRSF to reduce the direct landscape impacts of operations. Long-term impacts from the creation of the BRSF and removal of the rocky peaks of Amulsar Mountain will remain following restoration and post-closure monitoring; however the revegetation of the BRSF will lead to a more natural appearing landform and fit within the surrounding landscape in views from this LCT. Although large scale landscape changes will be perceptible from this LCT, the changes will be visible from a relatively small geographical area and many of the medium-term impacts will be reduced following the post-closure monitoring phase of the Project. Indirect impacts arising from visibility of the Project components across the southern extents of the LCT will be much reduced and will be visible from the context of a landscape which is already heavily influenced by man-made features.		
<b>Assessment Phase:</b>	<b>Magnitude of Landscape Impacts:</b>	<b>Significance &amp; Direction of Landscape Effects:</b>
Construction Phase: Year -1	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 3	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	Moderate	<b>Moderate</b> adverse (significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> neutral (not significant)

**Table 6.5.19: Highland Hills and Grazing (elevations of 2,300 - 2,700 m asl)**

Table 6.5.19: Highland Hills and Grazing (elevations of 2,300 - 2,700 m asl)		
<b>Project Components within LCT:</b> BRSF, building that contains crushing and screening facility, overland conveyor, haul road, truckshop and administration facilities platform located within LCT	<b>Representative Viewpoints located within LCT:</b> Illustrated by viewpoints 12, 15	
<b>Extent of Visibility across LCT:</b> Visibility of the Project from this LCT will be widespread across the study area, with open views from elevated highland slopes and hill summits to the north-west, north and east, and to a lesser extent south of the Project-affected area. Visibility of Project components from the localised areas of the LCT which lie within and adjacent to the LCT will be widespread especially across the western and eastern slopes of Amulsar Mountain.		
<b>Sensitivity of Landscape Receptor:</b> This relatively remote and open landscape shows characteristics of wildness and naturalness with very little human influence. The landform of the LCT has been shaped by glacial processes and erosion and its subtle slopes and features contrast with the craggy more distinguishable summits which often lie above. Views to development within the settled valleys and foothills which surround the LCT are contrasted by views to the undeveloped mountain summits above which are a key characteristic of this LCT. The <b>Jermuk Forest State Sanctuary – Specially Protected Nature Area</b> is predominantly located within this LCT and is sensitive to direct landscape change, where native oak woodland is highly characteristic. The sensitivity of the landscape features of this designated area to the landscape changes proposed is therefore judged to be <b>high</b> . Overall the sensitivity of this LCT to the landscape changes proposed is therefore judged to be <b>medium</b> .		
<b>Description of Landscape Impacts:</b> This LCT will experience direct landscape impacts from the construction of the BRSF, the building that contains the crushing and screening facility, overland conveyor, haul road and facilities platform. These components will require extensive earth works, resulting in the removal of large areas of existing sub-alpine vegetation, manipulation of landform, rerouting of natural drainage and the loss or disturbance of landscape features such as small river valleys. The project components will remain throughout the operation and production phases of the Project, during which the BRSF will increase in size, occupying a large bowl like hanging valley between North Erato and Little Erato, west of the Vorotan Valley at the northern extent of the Project main area. During the late winter and early spring months, the presence of dust across the snowpack will potentially increase the visible area of disturbance, as the surrounding snowfields become discolored by dust, which will be more apparent as the frequency of fresh snowfall decreases, later in the season. The changes resulting from many of the Project components will be reversible following closure and restoration of the Project main area. Long-term impacts arising from the change in landform and vegetation cover across the BRSF site will be irreversible, leading to permanent landscape changes, as the broad valley occupied by the BRSF site becomes a large man-made landform across a localised area, which is likely to have reduced land use capacity in the future. The long-term direct landscape changes which will occur within this LCT as a result of the Project will be visible across a much larger area of the LCT to the east of the Project main area. Views from this LCT to the rocky peaks and ridges which are directly affected by the Project will result in impacts upon a key characteristic of this LCT, and affect the remote and wild perceptual qualities of the LCT. The <b>Jermuk Forest State Sanctuary – Specially Protected Nature Area</b> will not experience direct landscape impacts upon the landscape areas of ancient native oak woodland and forest as a result of the Project. Although intervisibility of the Project will be possible from this area, indirect landscape impacts are considered unlikely to affect the key landscape features or reasons for designation. Therefore the landscape impact on this area is judged to be barely perceptible.		
<b>Assessment Phase:</b>	<b>Magnitude of Landscape Impacts:</b>	<b>Significance &amp; Direction of Landscape Effects:</b>
Construction Phase: Year -1	High	<b>Major</b> adverse (significant)
Operations Phase: Year 3	High	<b>Major</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	High	<b>Major</b> adverse (significant)
Closure Phase: Year 14	High	<b>Major</b> adverse (significant)
Post-Closure Monitoring Phase: Year 19	Moderate	<b>Moderate</b> neutral (significant)

**Table 6.5.20: High Rocky Peaks (elevations over 2,500 m asl)**

Table 6.5.20: High Rocky Peaks (elevations over 2,500 m asl)		
<b>Project Components within LCT:</b> Tigranes/Artavazdes open pit, Erato open pit and haul roads located within LCT	<b>Representative Viewpoints located within LCT:</b> None	
<b>Extent of Visibility across LCT:</b> Visibility will be widespread across the LCT, with all the key components of the Project visible from the areas of the LCT located within the Project affected area. Across the wider study area, visibility from elevated slopes and mountain peaks will be possible to the north-west, north-east and south, at a distance of over 10 km.		
<b>Sensitivity of Landscape Receptor:</b> The distinguishable rocky peaks and summits are the key features which define the LCT and are sensitive to visually intrusive development which will directly or indirectly affect these. The LCT represents the transition to an alpine landscape, with distinctive changes in vegetation, landform and landscape features not found within LCTs at lower altitudes. Its perceptual qualities of exposure, wildness and remoteness are accentuated by the lack of man-made features or built development within it or adjacent LCTs. The LCT also includes areas covered by the <b>Jermuk Forest State Sanctuary – Specially Protected Nature Area</b> , judged to be of <b>high</b> landscape sensitivity. Overall the sensitivity of this LCT to the landscape changes proposed is therefore judged to be <b>high</b> .		
<b>Description of Landscape Impacts:</b> This LCT will experience direct impacts as a result of the construction and operation of the haul road, Tigranes/Artavazdes open pit and the Erato open pit. The construction of the haul road across the western flanks and central peaks of Amulsar Mountain will require extensive earthworks (large scale cut and fill) and lead to a large area of the LCT within the Project main area being irreversibly changed. As the operational phases begin, the creation of the open pits will lead to the removal of the Tigranes, Artavazdes and Erato mountain peaks which form the central spine of the LCT. This area of rocky peaks and summits and surrounding craggy outcrops will be disturbed by the introduction of the man-made elements of the Project and lead to long-term loss of key characteristics of the LCT across a localised area. Dust from the construction and operation of the Project components and vehicle movements on site will lead to impacts across the areas of the LCT not directly affected by the Project footprint. During the different seasons this will lead to increased visibility, as dust created by operations settles across the surrounding vegetation in summer, and snowfields in winter, extending the visibly affected areas of the Project across areas of the surrounding slopes of Amulsar Mountain. The snow covered peaks of Amulsar Mountain are a key characteristic of the LCT and the direct impacts upon a proportion of these features will result in loss of the principal landscape features of the LCT which are of local and regional significance. Indirect landscape impacts resulting from intervisibility of the Project components from other areas of the LCT to the north, east and south will result, with long distance views to the often snow covered summits craggy summits of Tigranes, Artavazdes and Erato affected by changes in the visible skyline following the creation of the open pits. These landscape changes will be irreversible and long-term, and will be visible across a relatively large geographical area of the LCT, albeit that from a regional perspective such rocky peaks are widespread in this part of Armenia. Landscape impacts on the <b>Jermuk Forest State Sanctuary – Specially Protected Nature Area</b> located within the northern areas of this LCT, are judged to be barely perceptible.		
<b>Assessment Phase:</b>	<b>Magnitude of Landscape Impacts:</b>	<b>Significance &amp; Direction of Landscape Effects:</b>
Construction Phase: Year -1	High	<b>Major</b> adverse (significant)
Operations Phase: Year 3	High	<b>Major</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	High	<b>Major</b> adverse (significant)
Closure Phase: Year 14	High	<b>Major</b> adverse (significant)
Post-Closure Monitoring Phase: Year 19	High	<b>Major</b> adverse (significant)

### **6.5.20 Assessment of Residual Visual Effects**

The following section outlines the potential visual impacts of the Project on the visual receptors identified in the baseline (Section 4.3). Potential visual impacts are assessed with reference to the 17 representative viewpoints listed in Table 6.5.13. During the 21 year period of the Project within which construction, operation, closure and post-closure monitoring will be undertaken, visibility of vehicle activities, construction activities, and the visible components of the Project will provide a varying degree of intrusion into views. It may be possible to see views of the operational Project from all areas included within the ZTV (Figure 6.5.2), although the components which will be seen will vary from each location, occupy differing angles of view and to a varying extent of perceptibility.

The Project will have medium-term to long-term adverse impacts on the viewing experience of visual receptors identified as being within the ZTV for the Project, including people living and working close to the Project affected area. Recreational users and tourists within the Arpa River Gorge and Jermuk, residents within the settlements of Jermuk, Gndevaz, Saralanj, Saravan and Ughedzor, as the most sensitive receptors, will likely experience the most significant impacts.

#### **Impacts on Visual Receptors**

The following visual receptors will experience medium-term to long-term adverse visual impacts as a result of the proposed change in views and visual amenity from the construction, operation and closure of the Project:

- Residential receptors and tourists in the settlement of Jermuk will experience **moderate** adverse visual effects on long distance views of the building that contains the crushing and screening facility, truckshop and administration facilities during construction and operation, and the BRSF during operation, experiencing localised long-term **minor** adverse visual effects on views and visual amenity post closure and restoration, affecting a large number of residents and tourists;
- Residential receptors in the settlement of Kechut will have visibility of the most northerly components of the Project, including the building that contains the crushing and screening facility, truckshop and administration facilities during construction and operation, and the BRSF in the later stages of its operation. Residents will experience localised long-term **minor** adverse visual effects on views and visual amenity.
- Some residential receptors on the western edge of the settlement of Gndevaz will have views of the western extents of the Project during construction, operation and post closure of the Project, including visibility of the building that contains the crushing

- and screening facility, Erato and Tigranes/Artavazdes open pits, the haul road, the HLF and overland conveyor, experiencing localised **moderate** adverse visual effects on views and visual amenity, affecting a moderate number of residents;
- Residents within the settlement of Ughedzor will have views of the Erato and Tigranes/Artavazdes open pits and haul road during construction, operation and post closure of the Project, experiencing a long-term localised **minor** adverse visual effect on views and visual amenity, affecting a small number of residents who are resident for summer months only;
  - Residents within the settlement of Saralanj will have views of the Erato and Tigranes/Artavazdes open pits and haul road of the Project during construction and operation, and following closure. Receptors will experience a long-term localised **minor** adverse visual effect on views and visual amenity, affecting a limited number of residential properties with views towards Amulsar Mountain;
  - Residents within the southern extents of the settlement of Saravan will have views of the Erato and Tigranes/Artavazdes open pits and haul road during construction operation and post closure of the Project. Receptors will experience a long-term localised **minor** adverse visual effect on views and visual amenity, affecting a small number of residents;
  - Residents within the settlement of Gorayk will have no visibility of the Project components and therefore will experience no perceptible visual impacts as a result of the Project;
  - Seasonal herders, daily herders and agricultural workers will experience views of the Project from within the Vorotan valley to the east and the farmed foothills and grazed highland hills which surround the Project-affected area to the north, south and west. Visibility during construction and operation will be medium-term and result in **major** adverse visual effects which will reduce to **minor** post-closure of the Project, as the visual changes created by the open pits and BRSF will remain in the long-term, affecting a small number of people;
  - Seasonal herders, daily herders and agricultural workers will experience views of the Project from the farmed foothills and grazed highland hills which surround the Project-affected area, particularly in the vicinity of the HLF, where people on the slopes above may look down onto the HLF surface. Visibility during construction and operation will be medium-term and result in **major** adverse visual effects which will reduce to **minor** post-closure of the Project as the visual changes will remain in the long-term, affecting a small number of people moving around on the hills, away from the main arterial roads and the villages and towns;

- Agricultural workers (apricot growers etc.) and seasonal herders using the slopes west of the Arpa River gorge will experience views of the Project-affected area through construction and operation, and post closure, will experience a long-term **minor** adverse visual effect on views and visual amenity, for a small number of people, resulting from changes in the distant skyline through the creation of the open pits.;
- Receptors, including tourists, local residents and workers, travelling on the H-42 highway between the M-2 highway and Jermuk will also experience sequential views of different components of the Project-affected area when travelling from the north and south. Travellers will have views of the Erato and Tigranes/Artavazdes open pits, haul road, the HLF, ADR Plant, overland conveyor and site access roads from sections of the route resulting in **minor** to **major**, adverse medium-term visual effects during construction and operation, which will reduce to a **minor – moderate** adverse effect in the long-term, post closure of the mine. These effects will be experienced by a relatively large number of people travelling along this busy road;
- Receptors travelling east or west on the Armenian Silk Road (M-2 highway) through the study area will also experience sequential views of different components of the Project-affected area to the south of the Project-affected area. Travellers will experience glimpsed views of the Erato and Tigranes/Artavazdes open pits and haul road from different sections of the route resulting in **minor** adverse visual effects which will remain long-term post closure of the mine. These effects will be experienced by a relatively large number of people travelling along this busy road between Armenia and Iran.

### ***Representative Viewpoint Assessment***

Visual impacts from the representative viewpoints (viewpoint locations are shown on Figure 6.5.1 and are outlined in the tables which follow (Table 6.5.21 to Table 6.5.34). Each viewpoint assessment table provides the following information:

- Viewpoint location and distance from Project components;
- Potential visual receptor(s);
- Sensitivity of the visual receptor;
- Description of the existing views;
- Description of change in views;
- Magnitude of visual impact; and
- Significance of the visual effect.

The viewpoint assessment should be read in with reference to the viewpoint visualisations

(Figures 6.5.10 – 6.5.26), which include baseline photographs, bare ground wireframe images and photomontages.

The magnitude of visual impacts and significance of the subsequent visual effects was assessed for each phase of the Project defined within Table 6.5.10, and assumes full implementation of the mitigation measures outlined earlier in this chapter.

An assessment of potential visual impacts experienced during night time hours, from the lighting of the Project components and vehicle movements across the Project affected area, is also included for each viewpoint, with consideration of the magnitude of visual impact and significance of the visual effect.



**Table 6.5.21: Viewpoint 1: Top of Jermuk Ski Lift**

<b>Grid Reference:</b> E 558566, N 4409466		<b>Elevation:</b> 2424 m asl (+ 2 m)
<b>Distance from nearest Project Components:</b> 5.40 km		<b>Figure 6.5.10</b> Viewpoint 1: Top of Jermuk Ski Lift
<p><b>Viewpoint Location and Potential Receptors:</b> The viewpoint is located close to the top of the Jermuk Ski Slope lift occupying an elevated position overlooking the settlement of Jermuk to the west and the settled valley to the south, north of the Project-affected area. The viewpoint offers panoramic views in all directions, included long distance views south towards the Project-affected area. The potential receptors represented by this viewpoint are recreational skiers and tourists in winter, and tourists in summer (the numbers of which are relatively few). The viewpoint is located within the <i>Forested Upper Gorge and Foothills LCT</i>.</p> <p><b>Description of Existing Views:</b> The foreground of the existing view towards the Project-affected area is across grassed foothills and a shallow wooded valley to the valley plateau in the middle ground beyond. From the valley plateau, which contains the settlement of Kechut and Kechut Reservoir, the topography rises up gradually across the foothills of Little Erato to the higher ground of the Project-affected area. Amulsar Mountain forms the skyline beyond, where the peaks of North Erato and Erato are distinguishable features. To the north, west and east of the viewpoint the focus of the view is to the higher summits.</p> <p><b>Sensitivity of Visual Receptors:</b> Skiers, walkers in the hills and tourists are of high susceptibility to changes in the surrounding view while experiencing views of the landscape from this location. The view from this viewpoint is considered to be of regional importance and value for users who visit the ski slope from further afield, therefore the sensitivity of the representative receptors is judged to be <b>high</b>.</p> <p><b>Description of Visual Impacts:</b> Construction of the BRSF, the building that contains the crushing and screening facility, overland conveyor, truckshop and administration facilities, the access and haul roads will be perceptible from this viewpoint and vehicle movements will continue from construction into the operation and production phases, when the BRSF will become more perceptible as it increases in size from the deposition of barren rock, although it will be partially screened by intervening topography and will undergo progressive restoration as it increases in size. The HLF will not be visible from this viewpoint. Dust arising from construction and operation of the Project components will increase visibility of the working areas during the late winter/early spring months as the snow fields are discoloured by dust. During the operations phases the open pit of Tigranes/Artavazdes will be largely imperceptible from this location, however once extraction of the Erato open pit begins, the profile of the skyline to the west of North Erato will alter as the open pit increases in size.</p> <p>Food lighting of the overland conveyor, crushing and screening facility, truckshop and administration buildings will be continuous during the operations phase, and ambient light glow will be visible from the Erato open pit. Vehicle movements on site (along the access and haul roads), will be perceptible during the hours of darkness from this viewpoint, across the skyline of Amulsar Mountain, and the foothills slopes on the north side of Little Erato, which are otherwise unaffected by lighting at present. The headlights of large vehicles travelling northwards along the haul road (towards Jermuk) will be clearly visible from this viewpoint, and will introduce a moving visual distraction across an otherwise unlit part of the view during night time hours, which will be more extensive during the winter months.</p> <p>The BRSF will form a new large feature in the views towards Amulsar Mountain, whilst the crushing and screening facility buildings will appear prominent above the skyline west of Little Erato from this viewpoint. The other component parts of the Project will form relatively small elements at this distance while affecting a small proportion of the available view and the majority of changes will be medium-term and reversible following closure of the mine. Following closure, the built components of the Project will be removed; including the overland conveyor, crushing and screening facility, the access and haul roads, and the disturbed ground will be regraded and revegetated to restore the profile and land cover to a resemblance of the baseline situation. A cover system will be applied to the final regraded surface of the BRSF (as outlined in the pMRCRP, Appendix 8.18) and revegetated, which will reduce the perceptibility of this new landform within the surrounding landscape.</p> <p>The change in landform from the creation of the BRSF and Erato open pit will be irreversible and remain long-term; however the visual change will be slight and affect a small proportion of the available panoramic views from this location. The change will be distinguishable on the skyline in the distance following restoration measures and post-closure monitoring.</p>		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 3	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	Moderate	<b>Moderate</b> adverse (significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> neutral (not significant)
Night Time Lighting Impacts	Moderate	<b>Moderate</b> adverse (significant)



**Table 6.5.22: Viewpoint 2: Hotel Olympia, Jermuk**

<b>Grid Reference:</b> E 557105, N 4410044		<b>Elevation:</b> 2096 m asl (+ 2 m)
<b>Distance from nearest Project Components:</b> 6.5 km		<b>Figure 6.5.11:</b> Viewpoint 2: Hotel Olympia, Jermuk
<p><b>Viewpoint Location and Potential Receptors:</b> This viewpoint is located outside the Hotel Olympia and Sanatorium situated in the centre of Jermuk, north of the Project-affected area. The viewpoint is situated at the car park entrance alongside the roadside public walkway to the hotel. The viewpoint represents framed views seen from the car park, grounds and surroundings of the hotel, and similar views experienced from windows on the south side of the hotel and nearby residential properties within Jermuk. The potential receptors represented by this viewpoint are tourists and residents at the hotel and local residents within Jermuk in both the winter and summer seasons. The viewpoint is located within the <i>Forested Upper Gorge and Foothills LCT</i>.</p> <p><b>Description of Existing Views:</b> The foreground of the existing view is across the car park and surrounding grounds of the hotel, with the wooded gorge which cuts through Jermuk to the south of the hotel forming the middle ground of the view. Buildings located on the south of the gorge are partially screened by woodland. Long distance views towards the Amulsar Mountain, to the distinguishable peaks of Erato and North Erato, are framed by the eastern slopes of the valley in the middle distance. Views west, east and north from the viewpoint are enclosed by the surrounding woodland and buildings within the settlement of Jermuk.</p> <p><b>Sensitivity of Visual Receptors:</b> Tourists and residents are judged to be of high susceptibility to changes in the view, where opportunities for views to the surrounding landscape and mountains from this location are limited and therefore the focus of the view to the distinct mountain landscape south of Jermuk is judged to be of regional value. The sensitivity of the representative receptors is judged to be <b>high</b>.</p> <p><b>Description of Visual Impacts:</b> Construction of the BRSF, the buildings that contains the crushing and screening facility, overland conveyor, truckshop and administration buildings, access roads and haul road will be perceptible from this location, which along with visibility of vehicle movements (especially during night time hours) will continue through the operation and production phases of the Project. Dust arising from construction and operation of the Project components will increase perceptibility of the working areas during the late winter/early spring months as the snow fields become discoloured, which will be perceptible from this viewpoint. The HLF will not be visible from this viewpoint. The crushing and screening facility buildings will appear above the ridgeline to the west of Little Erato introducing built development to this otherwise undeveloped skyline, appearing more perceptible at night when lit and accessed by on site vehicles. The BRSF will become increasingly more visible as the operational phases progress and the BRSF increases in size, becoming visible to the south-east of Jermuk, altering the skyline of Amulsar Mountain. When mining of the Erato open pit commences, changes to the skyline of Amulsar Mountain will become perceptible as the peak and upper slopes of Erato Mountain are removed and the open pit increases in size through its excavation. Lighting of the overland conveyor, crushing and screening facility, truckshop and administration buildings and the Erato open pit, along with vehicle movements on site along the access and haul roads will be perceptible during the hours of darkness from this viewpoint, across the foothills on the north side of Little Erato which is otherwise unaffected by artificial lighting at present. The headlights of large vehicles travelling northwards along the haul road will be clearly visible from this viewpoint, and will introduce a moving visual distraction across an otherwise unlit part of the view during night time hours, which will be more extensive during the winter months. The accompanying components of the Project (overland conveyor, truckshop and administration buildings) will form small, almost imperceptible elements in the view at this distance and will remain for the medium-term; however impacts will be reversible following their removal during closure of the mine. Following closure, these components will be removed; including the access and haul roads, and the disturbed ground will be regraded and revegetated to restore the profile and land cover to a resemblance of the baseline situation. The BRSF will be subject to progressive restoration during the operational phases, and will be subsequently capped and revegetated, becoming less perceptible alongside the surrounding landform. The change in landform from the creation of the Erato open pit will be irreversible and remain long-term, distinguishable on the skyline following restoration measures and post-closure monitoring.</p>		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 3	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	Moderate	<b>Moderate</b> adverse (significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> neutral (not significant)
Night Time Lighting Impacts	Moderate	<b>Moderate</b> adverse (significant)

**Table 6.5.23: Viewpoint 3: Hotel Armenia, Jermuk**

<b>Grid Reference:</b> E 556928, N 4410153		<b>Elevation:</b> 2097 m asl (+ 2 m)
<b>Distance from nearest Project Component:</b> 6.5 km		<b>Figure 6.5.12:</b> Viewpoint 3: Hotel Armenia, Jermuk
<p><b>Viewpoint Location and Potential Receptors:</b></p> <p>This viewpoint is located at the entrance to the Armenia Hotel in Jermuk, north of the Project-affected area. Situated on the front terrace of the hotel, the viewpoint is frequented by visitors to the hotel and represents views experienced when leaving the hotel and views from the surrounding external grounds and south facing windows to the front of the hotel. The viewpoint also represents similar glimpsed views towards Amulsar Mountain experienced from the Jermuk hot springs to the east of the hotel. The potential receptors represented by this viewpoint are tourists and residents at the hotel in both the winter and summer seasons. The viewpoint is located within the <i>Forested Upper Gorge and Foothills LCT</i>.</p> <p><b>Description of Existing Views:</b></p> <p>The existing view from this location is focused on the surrounding foreground of the hotel and the adjacent hotel which is currently under construction. The presence of coniferous trees which surround the hotel to the south and east contain long distance views from this location, however glimpsed views between the trees in the middle distance offered framed views of the Amulsar Mountain. The peaks of Erato and North Erato are visible on the distant skyline from this viewpoint. Views west, east and north from the viewpoint are enclosed by the surrounding woodland and buildings within the immediate vicinity of the hotel.</p>		
<p><b>Sensitivity of Visual Receptors:</b></p> <p>Tourists are judged to be of high susceptibility to changes in the view, where opportunities for views to the surrounding landscape and mountains are limited and therefore where available the focus of the view to the surrounding mountain landscape is judged to be of regional value. The sensitivity of the representative receptors is judged to be <b>high</b>.</p>		
<p><b>Description of Visual Impacts:</b></p> <p>Construction of the BRSF, overland conveyor, truckshop and administration buildings, access roads and haul road may be perceptible from this location, in glimpsed views through the tree cover and built form which lies in the foreground of the view. Vehicle movements may be visible throughout the construction and operations phases of the project; however visibility of the Tigranes/ Artavazdes open pit, and the HLF will not be possible from this viewpoint.</p> <p>When mining of the Erato open pit commences, changes to the skyline of Amulsar Mountain will be perceptible as the peak of Erato Mountain is removed and the open pit increases in size. Dust arising from construction and operation of the Project components will increase perceptibility of the working areas during the late winter/early spring months as the snow fields become discoloured by dust, which will extend the degree to which the Project is perceptible from this viewpoint.</p> <p>Lighting of the overland conveyor, crushing facility, truckshop and administration buildings, and the Erato open pit, along with vehicle movements on site will be perceptible in the distance during hours of darkness; however this will be from the context of the street lit settlement of Jermuk in views from this location. The headlights of large vehicles travelling northwards along the haul road will be clearly visible from this viewpoint, and will introduce a moving visual distraction across currently unlit part of the view during night time hours, which will be more extensive during the winter months.</p> <p>The accompanying components of the Project (i.e. overland conveyor, truckshop and administration buildings) will form relatively small, almost imperceptible elements in the view at this distance and will remain for the medium-term; however impacts will be reversible following their removal during closure of the mine. Following closure, the built components of the Project will be removed; including the, access and haul roads, and the disturbed ground will be regraded and revegetated to restore the profile and land cover to a resemblance of the baseline situation.</p> <p>The change in landform from the creation of the Erato open pit and BRSF will be irreversible and remain long-term, distinguishable on the skyline following restoration measures; however from this viewpoint these changes will likely be the only visible remnants of the Project following post-closure monitoring.</p>		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	Low	<b>Minor</b> adverse (not significant)
Operations Phase: Year 3	Low	<b>Minor</b> adverse (not significant)
Operations Phase: Year 10 – Max. Case Scenario	Moderate	<b>Moderate</b> adverse (significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> neutral (not significant)
Night Time Lighting Impacts	Low	<b>Moderate</b> adverse (significant)

**Table 6.5.24: Viewpoint 4: Deer Sculpture west of Jermuk**

<b>Grid Reference:</b> E 556657, N 4409747		<b>Elevation:</b> 2213 m asl (+ 2 m)
<b>Distance from nearest Project Component:</b> 6.5 km		<b>Figure 6.5.13</b> Viewpoint 4: Deer Sculpture west of Jermuk
<p><b>Viewpoint Location and Potential Receptors:</b> This viewpoint is located adjacent to the deer sculpture which sits atop the edge of the valley on hills to the west of Jermuk, north of the Project-affected area. Situated in an elevated position it offers panoramic views in all directions. The viewpoint is accessed via a track to the south, which climbs steeply from the settlement of Jermuk and the potential receptors represented by this viewpoint are recreational users, walkers in the hills and tourists in both the winter and summer seasons. The viewpoint is located within the <i>Forested Upper Gorge and Foothills LCT</i>.</p> <p><b>Description of Existing Views:</b> The viewpoint offers elevated views across the wooded valley landscape around Jermuk and the steep gorge which runs along the foot of the valley below. The middle distance of the view is across the valley plateau with the abandoned airstrip and tower blocks of south Jermuk visible in the view. Long distance views across the foothills south of Jermuk rise up to the Amulsar Mountain which forms the skyline beyond. The peaks of North Erato and Erato are distinguishable features in long distance views and panoramic views west, east and north are possible across the surrounding foothills, to the distant mountain summits beyond.</p> <p><b>Sensitivity of Visual Receptors:</b> Recreational users, walkers in the surrounding hills and tourists are judged to be of high susceptibility to change in views, whilst experiencing the landscape from this location. The view from this viewpoint is considered to be of local importance and value for users who visit the sculpture, therefore the sensitivity of the representative receptors is judged to be <b>medium</b>.</p> <p><b>Description of Visual Impacts:</b> Construction of the BRSF, overland conveyor, building that contains the crushing and screening facility, truckshop and administration buildings, access roads, and haul road will be perceptible from this location, and the resultant changes will remain throughout the operational phases of the Project. The open pit of Tigranes/Artavazdes will not be visible from this viewpoint, however as operations and production commences, the BRSF will become more perceptible as it increases in size, appearing above the existing landform of the foothills to the north of Amulsar Mountain. Once mining of the Erato open pit commences, changes to the skyline of Amulsar Mountain will be perceptible as the peak of Erato Mountain is removed and the open pit increases in size. Dust arising from construction and operation of the Project components will increase perceptibility of the working areas during the late winter/early spring months as the snow fields are discoloured by dust. Lighting of the overland conveyor, crushing and screening building, truckshop and administration buildings, the Erato open pit along with movements of large vehicles along the access and haul roads on the western and northern sides of the mountain, will be perceptible during the hours of darkness from this viewpoint, appearing across the distant skyline which is otherwise unaffected by artificial lighting, albeit that this lighting will be seen in the context of the settlements of Jermuk and Kechut located in the valley below the viewpoint. Due to the orientation of haul roads, the headlights of vehicles travelling northwards towards the BRSF and the building that contains the crushing and screening facility will be very perceptible during night time hours and winter months. The components visible from this location will occupy a relatively small proportion of the available view in the medium-term. The features created by the open pit of Erato and the BRSF will remain following closure of the mine however impacts associated with all other component parts will be reversed once they are removed, including the overland conveyor, crushing and screening building, truckshop and administration buildings, and access and haul roads. Disturbed ground will be regraded and revegetated to restore the profile and land cover to a resemblance of the baseline situation. The change in landform from the creation of the BRSF and Erato open pit will be irreversible and remain long-term, distinguishable on the skyline, however the BRSF will be subject to progressive restoration and will subsequently be capped with topsoil and revegetated, becoming less perceptible within the immediate landscape following the post-closure monitoring phase.</p>		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 3	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	Moderate	<b>Moderate</b> adverse (significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> neutral (not significant)
Night Time Lighting Impacts	Moderate	<b>Moderate</b> adverse (significant)

**Table 6.5.25: Viewpoint 5: Western edge of Gndevaz Village**

<b>Grid Reference:</b> E 552765, N 4401848		<b>Elevation:</b> 1829 m asl (+ 2 m)
<b>Distance from nearest Project Component:</b> 2.08 km		<b>Figure 6.5.14:</b> Viewpoint 5: Western edge of Gndevaz Village
<p><b>Viewpoint Location and Potential Receptors:</b> This viewpoint on the elevated western edge of Gndevaz village to the west of the Project-affected area, offering views across the settlement to the agricultural landscape and Amulsar Mountain beyond. The viewpoint represents the views experienced by residents from residential properties and their surrounding curtilages located to the western extent of Gndevaz. The viewpoint is located within the <i>Settled Lowland and Rocky Gorges LCT</i>.</p> <p><b>Description of Existing Views:</b></p> <p>The foreground of the elevated view is across Gndevaz, which is located in a natural bowl feature to the east of the viewpoint and contained by the surrounding undulating landform. In the middle ground beyond the H-42 highway to the east, the undulating steppe plateau and foothills which cover the western extent of the Project-affected area rise up to the foothills of Amulsar Mountain, where the peaks of North Erato, Erato, Tigranes and Arshak are visible features on the distant skyline to the south-east of the viewpoint. Views north, south and west from the viewpoint are contained by the presence of surrounding landform, vegetation and built elements, including a number of communication masts which sit on the elevated ridge to the south.</p> <p><b>Sensitivity of Visual Receptors:</b></p> <p>The residents which are represented by this viewpoint are judged to be of high susceptibility to changes in the view, as appreciation of the surrounding view is material to the quality of life from the residential properties it represents and are therefore the views are judged to be of local value. The sensitivity of these receptors is therefore judged to be <b>high</b>.</p> <p><b>Description of Visual Impacts:</b></p> <p>During construction, the preparatory earthworks for the overland conveyor and access road will be perceptible across the intervening topography of the lower farmed foothills to the south-east of the viewpoint. The crushing and screening building, will be visible to the east of the viewpoint on the western flanks of Little Erato, while the overland conveyor will be visible crossing the higher ground east of Gndevaz to reach the HLF site. The construction of these components, along with the haul road on the west side of Amulsar Mountain and vehicle movements on site will also be perceptible from the western edge of Gndevaz, however activities during this phase will occupy a relatively small proportion of the available view and appear beyond existing man-made elements, including the H-42 highway, steel tower electricity transmission line and the built development within the settlement of Gndevaz. Temporarily vegetated topsoil stockpiles will be strategically located to the west of the HLF to screen immediate views of these project components as far as is practical from the settlement of Gndevaz and the H-42 highway.</p> <p>Once operation and production commences the open pit of Tigranes/Artavazdes will be visible to the south-east and changes in the profile of the existing skyline will occur as the mountain peaks are removed. The Erato open pit will extend visible changes to the skyline northwards as the third mountain peak is removed. Visibility of the HLF will also increase as phase 2 and phase 3 of the HLF operation extend its footprint northwards across the lower foothills of Amulsar Mountain, introducing visibility from the western edge of Gndevaz, where the working surface of the HLF will contrast with the surrounding landform and vegetation in the medium-term. Dust arising from construction and operation of the Project components will increase perceptibility of the working areas during the late winter/early spring months as the snow fields are discoloured by dust from this location. The existing steel tower overhead transmission line will remain to the west of the HLF, remaining visible from the settlement of Gndevaz and the adjacent H-42 highway.</p> <p>Flood lighting of the overland conveyor, crushing and screening facility, open pits and HLF, along with the movements of large vehicles on site will be perceptible during the hours of darkness from this viewpoint; however lighting will appear in the distance above the partially lit settlement of Gndevaz and in the context of lighting from vehicles travelling on the H-42 road.</p> <p>Following closure of the mine, the overland conveyor, crushing and screening facility and access roads will be removed and disturbed land will be regraded and revegetated, utilizing the stored topsoil stockpiles to restore the landform and land cover to a resemblance of the baseline situation. The alteration of the skyline of Amulsar Mountain to the south-east will be irreversible and although the HLF will remain, it will be capped with topsoil and revegetated, becoming less perceptible as it blends with the surrounding vegetation and landform following post-closure monitoring.</p>		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 3	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	Moderate	<b>Moderate</b> adverse (significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> neutral (not significant)
Night Time Lighting Impacts	Moderate	<b>Moderate</b> adverse (significant)

**Table 6.5.26: Viewpoint 6: H-42 highway south of Gndevaz**

<b>Grid Reference:</b> E 551961, N 4398867	<b>Elevation:</b> 1665 m asl (+ 2 m)	
<b>Distance from nearest Project Component:</b> 150 m	<b>Figure 6.5.15:</b> Viewpoint 6: H-42 highway South of Gndevaz	
<b>Viewpoint Location and Potential Receptors:</b> This viewpoint is located alongside the H-42 highway, to the south of Gndevaz and offers open views across the surrounding plateau farmland and undulating landscape of the Project-affected area to the east. The receptors represented by the viewpoint are road users travelling north on the H-42 highway between the junction of the Armenian Silk road (M-2 highway) and the settlement of Gndevaz, and also represents the views experienced by agricultural workers within the adjacent arable and pasture fields. The viewpoint is located within the <i>Lower farmed and settled foothills LCT</i> .		
<b>Description of Existing Views:</b> The foreground of views from this viewpoint is across the surrounding agricultural plateau landscape which lies to the east and west of this section of the H-42 highway, where a steel tower electricity transmission line runs parallel with the road to the east and is visible in views east and north-east from the viewpoint. In the middle distance, the steppe plateau and foothill landscape which covers the western extent of the Project-affected area, rising up to the foothills of Amulsar Mountain, where the peaks of North Erato, Erato and Tigranes are visible features on the distant skyline to the south-east of the viewpoint. Views west are possible across agricultural fields to the deep gorge and wooded foothills.		
<b>Sensitivity of Visual Receptors:</b> Road users are judged to be of low susceptibility to changes in views from this location. However, agricultural workers and herders within the surrounding agricultural fields are judged to be of medium susceptibility to changes in the view, as appreciation of the surrounding view is of greater value to these receptors. Overall the sensitivity of the represented receptors is judged to be <b>medium</b> .		
<b>Description of Visual Impacts:</b> Construction of the HLF, HLF pond, overland conveyor, , access roads will be visible from this viewpoint, appearing across the farmed lower foothills east of the H-42 highway and the foothills beyond. The visible components will appear beyond the steel tower electricity transmission line which runs parallel to the H-42 highway in the middle distance of the view. The building that contains the crushing and screening facility and the main haul road will also be visible in views from the H-42 highway, appearing across the distant skyline formed by Little Erato and Amulsar mountain. Temporarily vegetated topsoil stockpiles will be utilized to screen immediate views of the project componentry from the H-42 highway. Once operation and production commences the open pit of Tigranes/ Artavazdes will be perceptible on the skyline to the east of the viewpoint as the mountain peaks are removed and extraction of rock takes place. Dust arising from construction and operation of the Project components will increase perceptibility of the working areas during the late winter/early spring months as the snow fields are discoloured by dust. The changes to the skyline of Amulsar Mountain will be long-term and irreversible, and will extend northwards along the Amulsar Mountain ridge as mining of the Erato open pit begins. As the operations phase continues the HLF will become more perceptible beyond the intervening topsoil stockpiles east of the H-42 highway which will offer limited mitigation of the visual change as the HLF enters phase 2 and 3 of operation. Further screening could be provided through the provision of tree planting alongside the road to the east, however the HLF will eventually form a large feature in the available view east from this viewpoint, altering views towards the foothills of Amulsar Mountain beyond. These visual changes will remain long-term as the landform changes become permanent after regrading and revegetation during the closure phase of the Project. Flood lighting of the HLF, overland conveyor, crushing and screening facility, open pits, haul road and access roads, along with vehicle movements on site along the main access and haul roads will be perceptible during the hours of darkness from this viewpoint; and although the lighting will appear in the context of the adjacent settlement of Gndevaz to the west of the Project-affected area and lighting from vehicles travelling along the H-42 highway, it will introduce a substantial level of permanent artificial lighting across an area of relative darkness during construction and operation of the Project. During closure, potential borrow areas for obtaining clay for the capping of the HLF will be created. This short term disturbance will require the stripping and storage of vegetation and topsoil in neighboring berms and may be visible from this location. The overland conveyor, crushing and screening facility and access roads will be removed and although the visible HLF will remain, it will be regraded, capped and revegetated (as outlined in the pMRCRP, Appendix 8.18), becoming less perceptible as it blends with the surrounding vegetation and landform, so that once established the engineered landform of the HLF will be subtly altered to appear more sympathetic with the surrounding landform following post-closure monitoring. The long-term changes to the profile of the skyline of Amulsar Mountain from the creation of the open pits will be irreversible and will remain following post-closure monitoring.		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 3	High	<b>Major</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	High	<b>Major</b> adverse (significant)
Closure Phase: Year 14	Moderate	<b>Moderate</b> adverse (significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> adverse (not significant)
Night Time Lighting Impacts	High	<b>Major</b> adverse (significant)

**Table 6.5.27: Viewpoint 7: H-42 highway South-west of Heap Leach Facility**

Table 6.5.27: Viewpoint 7: H-42 highway South-west of Heap Leach Facility		
Grid Reference: E 551805, N 4398323	Elevation: 1589 m asl (+ 2 m)	
Distance from nearest Project Component: 410 m	Figure 6.5.16: Viewpoint 7: H-42 highway South-west of Heap Leach Facility	
<b>Viewpoint Location and Potential Receptors:</b> This viewpoint is located on the H-42 highway, to the south of the hairpin bends which run alongside the Arpa River Gorge, south of the HLF site. The receptors represented by the viewpoint are road users travelling north on the H-42 highway between the junction of the Armenian Silk road (M-2 highway) and the settlement of Gndevaz, and it also represents the views experienced by agricultural workers within the adjacent arable and pasture fields to the east and west of the road. The viewpoint is located within the <i>Lower farmed and settled foothills LCT</i> .		
<b>Description of Existing Views:</b> The foreground of views north-east from this viewpoint are along the H-42 highway towards the Project main area, with the crash barriers located along its western edge forming a key feature in the view. Views are contained by the steep topography adjacent to the east and north of the H-42 highway as it passes through the hanging valley above the Arpa River Gorge, with deciduous vegetation further screening views along the narrow valley towards the HLF site and towards the mountainous ridge on the skyline beyond. The viewpoint offers views west across agricultural land into the steep sided Arpa River Gorge and the wooded east facing slopes beyond. A steel tower electricity transmission line is located on the higher ground north of the viewpoint and appears across the skyline in the middle ground. Wood pole overhead lines also dissect the skyline in views north-east towards the HLF site and Amulsar Mountain beyond. Views east are limited by the steep road sidings directly adjacent to the H-42 highway in this location.		
<b>Sensitivity of Visual Receptors:</b> Road users, agricultural workers and herders within the surrounding agricultural fields are judged to be of low susceptibility to changes in the view, as appreciation of the surrounding view is not of specific value to these receptors from this location. The sensitivity of the represented receptors is judged to be <b>medium</b> .		
<b>Description of Visual Impacts:</b> Receptors travelling north along the H-42 highway will experience visibility of the ground works undertaken for the construction of the HLF, overland conveyor, and access roads. The HLF site and ADR plant are located directly north of the viewpoint but are substantially screened by the presence of steep intervening topography which lies adjacent to the H-42 highway as it winds around the edge of the Arpa River Gorge to the west. Further screening could be provided through the provision of tree planting between the corner on the road, at its lowest point, and the proposed HLF. Visibility of the overland conveyor and access roads will be possible in the distance, as they are constructed across the foothills west of Amulsar Mountain, linking the crushing and screening facility, which is visible on the distant skyline to the north-east, with the HLF site.		
Once operation and production commences the open pit of Tigranes/ Artavazdes will potentially be perceptible on the skyline to the north-east of the viewpoint, as the mountain peaks are removed and extraction of rock takes place. Dust arising from construction and operation of the Project components will increase visibility of the working areas during the late winter/early spring months as the snow fields are discoloured by dust, which may be perceptible from this viewpoint. The changes to the skyline will be long-term and irreversible, and will extend northwards along the Amulsar Mountain ridge as mining of the Erato open pit begins. Intervening screening from vegetation along the road sidings to the east of the viewpoint will screen some views towards the open pits in the spring and summer months. During the operational phases of the project, the HLF will increase in vertical height and extent and become more perceptible from this viewpoint, appearing above the intervening topography as the new unvegetated landform feature which will contrast with the surrounding foothills and agricultural land.		
The HLF will eventually form a new feature in the available view north from this viewpoint, altering views towards the foothills of Amulsar Mountain beyond. These visual changes will remain long-term as the landform changes become permanent, however during the closure phase, regrading and revegetation of the HLF will be undertaken to ensure the new landform blends subtly with the surrounding landform and vegetation, so that once established the engineered landform of the HLF will appear more sympathetic with the surrounding landscape. The overland conveyor and crushing and screening facility, will be removed during the closure phase of the project and disturbed areas of the Project site will be restored and regraded to ensure long-term impacts from these components of the Project do not occur.		
Lighting of the HLF, ADR plant, overland conveyor, crushing and screening facility, open pits, haul road and access roads, along with vehicle movements on site will be perceptible during the hours of darkness from this viewpoint, it will introduce a substantial level of permanent artificial lighting across an area of relative darkness during construction and operation of the Project.		
The long-term changes to the profile of the skyline of Amulsar Mountain will be irreversible and will remain following post-closure monitoring.		
Assessment Phase:	Magnitude of Visual Impacts:	Significance & Direction of Visual Effects:
Construction Phase: Year -1	Low	<b>Minor</b> adverse (not significant)
Operations Phase: Year 3	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	Moderate	<b>Moderate</b> adverse (significant)
Closure Phase: Year 14	Moderate	<b>Moderate</b> adverse (significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> neutral (not significant)
Night Time Lighting Impacts	Moderate	<b>Moderate</b> adverse (significant)



**Table 6.5.28: Viewpoint 8: Armenian Silk Road (M-2 highway) near Junction with the H-42 highway**

Grid Reference: E 548084, N 4393759	Elevation: 1354 m asl (+ 2 m)	
Distance from nearest Project Component: 6.13 km	Figure 6.5.17: Viewpoint 8: Armenian Silk Road (M-2 highway) near Junction with the H-42 highway	
<b>Viewpoint Location and Potential Receptors:</b> This viewpoint is located alongside the Armenian Silk Road (M-2 highway) between the junction with the H-42 highway to Jermuk to the west and the settlement of Saravan to the north-east, south-west of the Project-affected area. The viewpoint illustrates framed views along the gorge of the Darb river and is representative of views experienced by road users travelling east towards Iran on the Armenian Silk Road, and also represents the views experienced by agricultural workers within the adjacent arable fields and fruit orchards. The viewpoint is located within the <i>Settled Lowland and Rocky Gorges LCT</i> .		
<b>Description of Existing Views:</b> The view from this viewpoint is focused along the steep sided gorge of the Darb River, with the foreground made up of the wide road along the narrow valley bottom, alongside the adjacent arable fields and fruit orchards, with the wooded river corridor below. A wood pole electricity transmission line runs parallel with the road in the centre of the view. The partially wooded slopes of the gorge make up the middle ground of the view and frame the long distance views to Amulsar Mountain which forms the skyline in the far distance. Similar views are available when travelling west along the road, while views north and south from this viewpoint are contained by the steep and partially wooded valley sides of the gorge.		
<b>Sensitivity of Visual Receptors:</b> Road users and agricultural workers within the surrounding agricultural fields are judged to be of low susceptibility to changes in the view, as appreciation of the surrounding view is not of specific value to these receptors from this location. The sensitivity of the represented receptors is judged to be <b>low</b> .		
<b>Description of Visual Impacts:</b> Visibility of construction activities are not likely to be perceptible from this viewpoint, as the construction of the haul road is unlikely to be perceptible at this distance, and further changes to views will not occur until operation of the Tigranes/Artavazdes open pit. Changes to the distant skyline of the Amulsar Mountain will result from the removal of the mountain peaks. This will extend northwards along the ridge as the Erato open pit commences operation. Although visible these long-term and irreversible changes to the view will form a relatively small feature within the available view, and at a considerable distance from the viewpoint, and will be experienced while travelling at speed along the M-2 highway, where the distant mountains are not the key focus of the view, and small scale changes will not be easily discernable. Dust deposited across the surrounding areas of the Project components will be largely imperceptible from this viewpoint for much of the year, however during the late winter/early spring months, the areas directly surrounding the open pits may be more perceptible as dust from the mining operations settles discolours the adjacent snow fields. Lighting of the open pits and haul road on the distant skyline, along with movements of large vehicles on site made more perceptible during the hours of darkness and during winter months from this viewpoint; however the lighting will appear in the context of the headlights of vehicles travelling along the M-2 highway and at a large distance and different elevation to receptors at this viewpoint and similar locations along the M-2 highway. The long-term permanent changes to the skyline created by the open pits will remain following post-closure monitoring of the Project.		
<b>Assessment Phase:</b>	<b>Assessment Phase:</b>	<b>Assessment Phase:</b>
Construction Phase: Year -1	Barely perceptible	<b>Negligible</b> adverse (not significant)
Operations Phase: Year 3	Low	<b>Minor</b> adverse (not significant)
Operations Phase: Year 10 – Max. Case Scenario	Low	<b>Minor</b> adverse (not significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Barely perceptible	<b>Negligible</b> neutral (not significant)
Night Time Lighting Impacts	Low	<b>Minor</b> adverse (not significant)

**Table 6.5.29: Viewpoint 9: Armenian Silk Road (M-2 highway) in Saralanj village**

<b>Grid Reference:</b> E 557307, N 4395581		<b>Elevation:</b> 2158 m asl (+ 2 m)
<b>Distance from nearest Project Component:</b> 4.18 km		<b>Figure 6.5.18:</b> Viewpoint 9: Armenian Silk Road (M-2 highway) in Saralanj Village
<p><b>Viewpoint Location and Potential Receptors:</b></p> <p>This viewpoint is located on the eastern edge of the settlement of Saralanj, situated in an elevated position alongside the Armenian Silk Road (M-2 highway), south of the Project-affected area. The viewpoint illustrates pitched views from residential properties within the settlement of Saralanj, to the surrounding foothills and summits of Amulsar Mountain which form the skyline to the north, and is located within the <i>Lower Farmed and Settled Foothills LCT</i>.</p> <p><b>Description of Existing Views:</b></p> <p>The Armenian Silk Road (M-2 highway) crosses the foreground of the view, with residential properties and agricultural buildings located in an elevated position to the north of the road. The middle distance of the view is across the arable and pastoral land which surrounds the settlement, rising up across the foothills which are crossed by a number of electricity transmission lines from west to east. Beyond the foothills, the higher peaks of Amulsar Mountain, with their craggy summits and scree slopes form the distant skyline. Views west and east of from the viewpoint are focused along the route of the Armenian Silk Road, which climbs steeply from the deep gorge in the west, up to the head of the Vorotan pass in the east. Views south from the viewpoint are across the wooded valley of the River Darb, where the adjacent foothills rise up to high summits which mark the southern RA border with the Nakhijevan Autonomous Republic (an exclave of Azerbaijan).</p>		
<p><b>Sensitivity of Visual Receptors:</b></p> <p>The residents which are represented by this viewpoint are judged to be of high susceptibility to changes in views, as appreciation of the surrounding view is material to the quality of life from the residential properties it represents and therefore the views are judged to be of local value. The sensitivity of these receptors is therefore judged to be <b>high</b>.</p>		
<p><b>Description of Visual Impacts:</b></p> <p>Limited visibility of construction activities will be perceptible from this viewpoint to the south-west of the Project-affected area, limited to distant views of the haul road on the western side of the Amulsar Mountain ridge. Other key components of the Project will be screened by the steep intervening topography to the north of the viewpoint.</p> <p>During the operational phases of the Project, the open pit of Tigranes/Artavazdes will be visible across the skyline of Amulsar Mountain to the north-east. The removal of the mountain peaks to create the open pit will create a long-term and irreversible change to the skyline which forms the backdrop to views north-east from the settlement of Saralanj. As operations progress the creation of the Erato open pit will remove a third mountain peak from the Amulsar Mountain ridge. The changes to the profile of the skyline to the east, north-east will be largely imperceptible from the settlement of Saralanj and the changes will affect only a small proportion of the available views from this viewpoint.</p> <p>Dust across the surrounding areas of the visible Project components will be largely imperceptible from this viewpoint, however during the late winter/early spring months; the areas surrounding the open pits and haul road may be more visible as dust from the mining operations settles and discolours the adjacent snow fields.</p> <p>Lighting of the open pits along with vehicle movements along the on-site haul road around the western flanks of the mountain will be perceptible during the hours of darkness and exacerbated during the winter months from this viewpoint; however the lighting will appear in the context of the lights of vehicles travelling along the M-2 highway and lighting from the settlement of Saralanj and nearby settlement of Saravan, appearing at a relatively large distance and different elevation from receptors at the viewpoint and similar locations along the M-2 highway.</p> <p>The long-term changes to the profile of the skyline of Amulsar Mountain will be irreversible and will remain following post-closure monitoring.</p>		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	Low	<b>Minor</b> adverse (not significant)
Operations Phase: Year 3	Low	<b>Minor</b> adverse (not significant)
Operations Phase: Year 10 – Max. Case Scenario	Moderate	<b>Minor</b> adverse (not significant)
Closure Phase: Year 14	Moderate	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> neutral (not significant)
Night Time Lighting Impacts	Low	<b>Minor</b> adverse (not significant)



**Table 6.5.30: Viewpoint 10: North end of Ughedzor Village**

<b>Grid Reference:</b> E 558390, N 4393710		<b>Elevation:</b> 2016 m asl (+ 2 m)
<b>Distance from nearest Project Component:</b> 4.64 km		<b>Figure 6.5.19:</b> Viewpoint 10: North end of Ughedzor Village
<p><b>Viewpoint Location and Potential Receptors:</b></p> <p>This viewpoint is located within the rural settlement of Ughedzor, south of the Armenian Silk Road (M-2 highway). The settlement was uninhabited until recent years, but is now inhabited by a small number of farming families during summer months only and is accessed by a track which crosses the valley of the River Darb from the north. The viewpoint illustrates views from residential properties located within the settlement, to the surrounding foothills and summits of Amulsar Mountain which form the skyline beyond. The viewpoint is located within the <i>Lower Farmed and Settled Foothills LCT</i>.</p> <p><b>Description of Existing Views:</b></p> <p>The foreground of the view is made up of pastoral grazing land, with sporadic residential properties and agricultural buildings located either side of the access track to the north. Two wood pole electricity transmission lines cross the foreground from south to north. In the middle distance the landform rises up across the foothills of the Amulsar Mountain, where a large electricity substation and numerous steel tower transmission lines cross the landscape, breaking the skyline to the east towards the head of the Vorotan Pass. In the distance to the north, the craggy summits of the Amulsar Mountain, including the peaks of Tigranes, Artavazdes and Arshak form distinguishable features on the skyline. Views south from the viewpoint are across foothills which rise up to the high summits which mark the southern RA border with the Nakhijevan Autonomous Republic (an exclave of Azerbaijan).</p>		
<p><b>Sensitivity of Visual Receptors:</b></p> <p>The small numbers of residents which are represented by this viewpoint are judged to be of high susceptibility to changes in the view, as appreciation of the surrounding view is material to the quality of life from the residential properties it represents and are therefore the views are judged to be of local value. The sensitivity of these receptors is therefore judged to be <b>high</b>.</p>		
<p><b>Description of Visual Impacts:</b></p> <p>Construction activities will be largely imperceptible from this viewpoint to the south-west of the Project-affected area. Visibility of the haul road across the western side of the Amulsar Mountain ridge may be perceptible from this location, albeit at a relatively large distance and in the context of existing disturbance on this side of the mountain.</p> <p>During the operations phases of the Project the open pit of Tigranes/Artavazdes will be visible on the skyline of Amulsar Mountain to the north-east. The removal of the distinctive craggy mountain peaks to create the open pit will create a long-term and irreversible change to the skyline which forms the backdrop to views north-east across the valley from the settlement of Ughedzor. As operations progress the creation of the Erato open pit will remove a third mountain peak from the Amulsar Mountain ridge, however this will be barely perceptible on the distant horizon to the north-east.</p> <p>Dust across the surrounding areas of the Project components will be largely imperceptible from this viewpoint, however while Amulsar Mountain is snow-covered; the areas surrounding the open pits and haul road may be more visible as dust from the mining operations discolours the adjacent snow fields.</p> <p>Lighting of the open pits and haul road on the distant horizon, along with the movements of vehicle along the haul road across the western side of the mountain will be perceptible during the hours of darkness from this viewpoint; however the lighting will appear in the context of lights from vehicles potentially travelling along the M-2 highway to the north-east of the viewpoint, appearing at a relatively large distance and different elevation from the viewpoint.</p> <p>Following closure the long-term changes to the profile of the skyline of Amulsar Mountain will be irreversible and will remain following post-closure monitoring.</p>		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	Low	<b>Minor</b> adverse (not significant)
Operations Phase: Year 3	Low	<b>Minor</b> adverse (not significant)
Operations Phase: Year 10 – Max. Case Scenario	Low	<b>Minor</b> adverse (not significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> neutral (not significant)
Night Time Lighting Impacts	Low	<b>Minor</b> adverse (not significant)

**Table 6.5.31: Viewpoint 11: Syunik Gates on the Vorotan Pass (M-2 highway)**

<b>Grid Reference:</b> E 561166, N 4393305	<b>Elevation:</b> 2345 m asl (+ 2 m)	
<b>Distance from nearest Project Component:</b> 3.89 km	<b>Figure 6.5.20:</b> Viewpoint 11: Syunik Gates on the Vorotan Pass (M-2 highway) between Saravan and Goryak	
<b>Viewpoint Location and Potential Receptors:</b> This viewpoint is located adjacent to the Syunik Gates which marks the summit of the Vorotan Pass on the Armenian Silk Road (M-2 highway), south of the Project-affected area. The viewpoint represents views experienced by tourists and cyclists travelling the route of the silk road and ordinary road users of this key transport link between Iran and Armenia. The viewpoint is located within the <i>Highland Hills and Grazing LCT</i> .		
<b>Description of Existing Views:</b> The foreground of the view towards the Project-affected area, is formed by the highland grazing pasture which covers the foothills and lower slopes of Amulsar Mountain, where a Soviet era communications tower is visible on the skyline in the mid-distance. A steel tower transmission line crosses the middle ground of the view, passing over the higher ground from east to west. In the distance to the north, Amulsar Mountain rises to where the craggy summits of Tigranes and Artavazdes, and the natural rocky escarpments and scree slopes across Arshak and its subsidiary peaks are distinguishable features on the skyline, and from a key feature in the view. The viewpoint offers open views into the valley of the River Darb to the west and to the lower Vorotan Valley and Spandaryan Reservoir to the east. Views south from the viewpoint are across foothills which rise up to the high summits which mark the southern RA border with Nakhijevan Autonomous Republic (an exclave of Azerbaijan).		
<b>Sensitivity of Visual Receptors:</b> Although frequented by lower sensitivity road users, the viewpoint represents tourists which are judged to be of medium susceptibility to changes in the view from this location, as appreciation of the surrounding view is of regional value. The sensitivity of the represented receptors is judged to be <b>medium</b> .		
<b>Description of Visual Impacts:</b> Construction activities will not perceptible from this viewpoint to the south-west of the Project-affected area. During the operational phases formation of the open pit of Tigranes/Artavazdes will become visible on the skyline of Amulsar Mountain, north along the ridge beyond the mountain peak of Arshak. The removal of the mountain peaks to create the open pit will create a long-term and irreversible change to the skyline which forms the backdrop to views from the gates located at the top of the Vorotan Pass. Dust across the surrounding areas of the Project components will be largely imperceptible from this viewpoint, however during the winter months; the areas surrounding the Tigranes/Artavazdes open pit will become more visible as dust from the mining operations discolours the adjacent snow fields. Although the Tigranes/Artavazdes open pit will be visible from this viewpoint, it will appear beyond the communications tower and steel tower overhead transmission line located in the middle distance of the available views, and alongside the natural rocky escarpments and scree slopes found across the mountain of Arshak and its subsidiary peaks to the south of the Tigranes/Artavazdes open pit. The Erato open pit and other more distant components will not be visible from this viewpoint throughout the life of the Project. Lighting of the Tigranes/Artavazdes open pit on the distant horizon, along with vehicle movements nearby along the haul road site will be perceptible during the hours of darkness from this viewpoint, appearing to the north of the viewpoint across the skyline of Amulsar Mountain which is otherwise unaffected by lighting at present. Following closure the long-term changes to the profile of the skyline of Amulsar Mountain will be irreversible, however they could appear similar to the existing natural rocky escarpments and scree slopes of the mountain of Arshak following post-closure monitoring.		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	Barely perceptible	<b>Negligible</b> adverse (not significant)
Operations Phase: Year 3	Low	<b>Minor</b> adverse (not significant)
Operations Phase: Year 10 – Max. Case Scenario	Low	<b>Minor</b> adverse (not significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Barely perceptible	<b>Negligible</b> neutral (not significant)
Night Time Lighting Impacts	Low	<b>Minor</b> adverse (not significant)

**Table 6.5.32: Viewpoint 12: Armenian Silk Road (M-2 highway) between Tsghuk and Gorayk**

<b>Grid Reference:</b> E 568877, N 4392779		<b>Elevation:</b> 2127 m asl (+ 2 m)
<b>Distance from nearest Project Component:</b> 7.95 km		<b>Figure 6.5.21:</b> Viewpoint 12: Armenian Silk Road (M-2 highway) between Tsghuk and Gorayk
<p><b>Viewpoint Location and Potential Receptors:</b> This viewpoint is located alongside the Armenian Silk Road (M-2 highway) between the settlements of Tsghuk and Gorayk within the lower Vorotan Valley adjacent to Spandaryan Reservoir, south-east of the Project-affected area. The viewpoint represents views experienced by road users travelling on the Armenian Silk Road, and views experienced by agricultural workers and herders within the adjacent arable fields and pasture. The viewpoint is located within the <i>High Steppe and Plateau Grassland LCT</i>.</p> <p><b>Description of Existing Views:</b> The view west, north-west from this viewpoint is focused along the route of the silk road which crosses the open plateau landscape east of Spandaryan reservoir, where arable fields and pasture are dissected by steel tower electricity transmission lines which form key linear features, crossing the plateau landscape north and south of the road. To the north-west, the distant mountain peaks of Amulsar Mountain form the skyline, including the distinguishable summits of Arshak, Tigranes, Artavazdes and North Erato, rising up from the Vorotan valley to the north and from the head of the Vorotan Pass to the west of the viewpoint. Views west from the viewpoint are focused across the adjacent arable and pasture farmland to the settlement of Tsghuk and Spandaryan Reservoir, before rising up across the foothills to the high summits which mark the southern RA border with Artsakh which forms the skyline beyond.</p>		
<p><b>Sensitivity of Visual Receptors:</b> Road users, agricultural workers and herders within the surrounding agricultural fields are judged to be of low susceptibility to changes in the view, as appreciation of the surrounding view is not of specific value to these receptors from this location. The sensitivity of the represented receptors is judged to be <b>low</b>.</p>		
<p><b>Description of Visual Impacts:</b> No construction activities will be visible from this viewpoint. As the operation and production phase begins the open pit of Tigranes/Artavazdes will be visible on the skyline of Amulsar Mountain, leading to a long-term and irreversible change to a small proportion of the ridge of mountain summits which forms the skyline of the western slopes of the Vorotan Valley. Dust across the surrounding areas of the open pits will be largely imperceptible from this viewpoint, however during the winter months; the areas surrounding the open pits may be more perceptible as dust from the mining operations discolours the adjacent snow fields.</p> <p>The Erato open pit become visible from this viewpoint in the latter stages of the operations phase of the Project. Although the southern and eastern edge of the Tigranes/Artavazdes open pit and the eastern edge of the Erato open pit will be perceptible from this viewpoint, it will appear beyond the numerous steel tower transmission lines which cross the plateau north of, and in parallel to the M-2 highway. Lighting of the open pits, along with vehicle movements on site between the open pits will be perceptible during the hours of darkness from this viewpoint. Artificial lighting from fixed or mobile (vehicles) sources will appear in the distance to the north across Amulsar Mountain which is otherwise unaffected by artificial lighting at present. However, any visibility of lighting will be in the context of potential artificial lights from vehicles travelling on the M-2 highway and the settlement of Gorayk in the middle distance of views to the west.</p> <p>Following closure, to the profile of the skyline of Amulsar Mountain will be irreversible and will remain following post-closure monitoring, albeit that they will be appear relatively imperceptible following restoration and rehabilitation of the areas directly surrounding the open pits.</p>		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	Barely perceptible	<b>Negligible</b> adverse (not significant)
Operations Phase: Year 3	Low	<b>Minor</b> adverse (not significant)
Operations Phase: Year 10 – Max. Case Scenario	Low	<b>Minor</b> adverse (not significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Barely perceptible	<b>Negligible</b> neutral (not significant)
Night Time Lighting Impacts	Low	<b>Minor</b> adverse (not significant)

**Table 6.5.33: Viewpoint 13: Minor road through Vorotan Valley**

<b>Grid Reference:</b> E 562986, N 4403300	<b>Elevation:</b> 2391 m asl (+ 2 m)	
<b>Distance from nearest Project Component:</b> 1.5 km	<b>Figure 6.5.22:</b> Viewpoint 13: Minor road through Vorotan Valley	
<b>Viewpoint Location and Potential Receptors:</b> This viewpoint is located within the Vorotan Valley, east of the Project-affected area and adjacent to the minor road which runs north to south linking the H-42 highway near Kechut to the M-2 highway east of Gorayk. The viewpoint represents views experienced by road users travelling on the minor road through the Vorotan Valley and the views experienced by shepherds, herders and people foraging from the land within the pastoral landscape of the Vorotan Valley. The viewpoint is located in the <i>High Steppe and Plateau Grassland LCT</i> .		
<b>Description of Existing Views:</b> The foreground of the existing view in all directions from this location is across the open steppe pasture which covers the lower slopes and valley bottom of the Vorotan Valley. The Vorotan lies to the east and south but is not visible from the viewpoint. In the middle distance to the south-west the lower foothills of Amulsar Mountain rise up from the valley, cut by narrow mountain stream valleys which feed the Vorotan River below. The peaks of North Erato, Erato, Tigranes, Artavazdes and Arshak are visible on the skyline above forming a ridge of mountains which overlook the Vorotan Valley in views south from the viewpoint. Views east to the opposing slopes of the Vorotan Valley are across open steppe pasture, backed by the foothills and eastern Zangezur Mountains beyond. To the north, rolling foothills are cut by broad and deep valleys which feed the tributaries of the Vorotan River. The small scale hydropower plant located in the valley to the south is not visible from this location; however the connecting electricity transmission line which runs south is visible, backclothed against the eastern valley slopes to the south.		
<b>Sensitivity of Visual Receptors:</b> Minor road users, herders and people foraging from the land within the surrounding pastoral landscape are judged to be of medium susceptibility to changes in the view, as the setting of the place of work is deemed important to the quality of working life for receptors in this location. The view from the Vorotan valley to the surrounding mountains is deemed to be of local value. The sensitivity of the represented receptors is judged to be <b>medium</b> .		
<b>Description of Visual Impacts:</b> During the construction phase, access roads, haul road and the BRSF will become visible in views towards Amulsar Mountain, as earth works are carried out to construct these components, including the stripping of vegetation, topsoil and sub soil and lining of the BRSF. Vehicle movements on site throughout this phase will continue into the operations phase as the Tigranes/Artavazdes open pit is created, removing the craggy mountain peaks which form the central ridge of Amulsar Mountain to the south-west of the viewpoint. Dust from the Project components will be visible from this viewpoint and during the winter months, the areas surrounding the open pits, BRSF and haul and access roads may be more visible as dust from the mining operations discolours the adjacent snow fields. The barren rock of the BRSF will fill the hanging bowl-like valley feature which lies out of view from the viewpoint to the west, south-west, beyond the eastern ridge of Amulsar Mountain. As barren rock is deposited in the BRSF this new landform feature will gradually become perceptible above the ridge in views from the Vorotan Valley. Excavation of the Erato open pit will remove a third mountain peak of Amulsar Mountain and although partially screened by the presence of North Erato it will extend the long-term and irreversible visual change northwards along the skyline. Lighting of the open pits, haul road, BRSF and access roads along with vehicle movements on site will be perceptible during the hours of darkness from this viewpoint. Lighting will appear in views across the skyline ridge of Amulsar Mountain from the Vorotan Valley, views of which are currently unaffected by lighting. No other sources of lighting will be visible from this location. Lighting from vehicles moving between the open pits, BRSF and the building that contains the crushing and screening facility will be perceptible within the Vorotan Valley and will introduce lighting to an area of the study area otherwise unaffected by light sources. At the closure phase of the mine, the haul road and access area will be removed and the disturbed ground regraded and revegetated. The BRSF will be progressively restored during operation of the mine, and will be subsequently capped with topsoil and revegetated, becoming less perceptible as it blends with the surrounding vegetation and landform, following the completion of mining activities. The long-term changes to the profile of the skyline of Amulsar Mountain from the creation of the open pits will be irreversible.		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 3	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	High	<b>Major</b> adverse (significant)
Closure Phase: Year 14	Moderate	<b>Moderate</b> adverse (significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> adverse (not significant)
Night Time Lighting Impacts	High	<b>Major</b> adverse (significant)

**Table 6.5.34: Viewpoint 14: Little Erato**

Table 6.5.34: Viewpoint 14: Little Erato		
Grid Reference: E 559564, N 4401931	Elevation: 2666 m asl (+ 2 m)	
Distance from nearest Project Component: Adjacent to BRSF	Figure 6.5.23: Viewpoint 14: Little Erato	
<b>Viewpoint Location and Potential Receptors:</b> The viewpoint is situated on the south-eastern flank of the summit of Little Erato, a rounded mountain located to the north of the main peaks of Amulsar Mountain. The viewpoint represents views experienced by shepherds, herders and people foraging from the land within the pastoral landscape of the steppe pasture foothills. The viewpoint is located within the <i>Highland Hills and Grazing LCT</i> . <b>Description of Existing Views:</b> This viewpoint offers open panoramic views in all directions, across the surrounding pastoral foothills, cut by broad mountain valleys in the foreground to the north, west and east. In the middle distance to the north, Amulsar Mountain rises up to form a ridge of summits trending south-eastwards from the viewpoint, with the craggy summits of North Erato and Erato visible as key features on the skyline. To the east, the rolling foothills and valleys roll down to the Vorotan Valley below, with the broad valley floor rising up to the foothills and mountains of the Zangezur, incised by the Vorotan Valley, which form the backdrop and skyline of long distance views east, north-east from the viewpoint. Views into the settled valley of the Arpa River to the north and west are possible from the summit of Little Erato, where the settlements of Kechut and Jermuk are visible in the distance below.		
<b>Sensitivity of Visual Receptors:</b> Herders and people foraging from the land within the surrounding pastoral landscape are judged to be of medium susceptibility to changes in the view, as the setting of the place of work is deemed important to the quality of working life for receptors in this location. The view from this prominent local hill to the nearby mountain peaks and valleys is deemed to be of local value. The sensitivity of the represented receptors is judged to be <b>medium</b> .		
<b>Description of Visual Impacts:</b> During the construction phase the main access roads, the BRSF, truckshop and administration buildings, haul road, crushing and screening facility, and overland conveyor will become visible to the east and south of the viewpoint, occupying a large proportion of the available view and introducing man-made elements to this mountain landscape. Earthworks to construct the BRSF, haul road and crushing and screening facility will lead to changes in the localised landform in the foreground and middle ground of views. As operation and production commences vehicle movements on the on-site haul road between the open pits, the building that contains the crushing and screening facility and BRSF will be continuous as barren rock and ore is extracted from the open pits, this will generate fallout of dust which will be visible across a wider area than the footprint of the components and lead to the dis-colouration of the snow fields during winter months. During this phase the BRSF will increase in size and become visible to the east of the viewpoint, as the deposited barren rock fills the bowl like hanging valley and creates a new domed landform, eventually extending to a greater elevation than the summit of Little Erato. Run of mine material and low grade stockpiles are will be located to the east of the viewpoint adjacent to the BRSF, which will become the defining feature in views to the south and east from this viewpoint, however progressive restoration will be undertaken throughout the operational period to regrade and revegetate the outer slopes of the new BRSF landform feature as it increases in size. The Tigranes/Artavazdes open pit will not be visible throughout the life of the Project, however the Erato open pit and run of mine stockpile will change the profile of the skyline from year six onwards as the extraction of barren rock and ore begins. Lighting of the Erato open pit, haul road, active areas of the BRSF, access road, crushing and screening facility, overland conveyor, truckshop and administration buildings, along with vehicle movements on site will be perceptible during the hours of darkness from this viewpoint, which will be more extensive during the winter months. Lighting will appear across a large proportion of the available view from the viewpoint, including across Amulsar Mountain and its foothills to the south and east respectively, which are otherwise unaffected by lighting. The medium-term and reversible visual changes associated with the overland conveyor, truckshop and administration buildings, haul road, crushing and screening facility and access roads will be reversed following closure of the mine as disturbed ground is regraded and revegetated. The BRSF will be capped with topsoil and revegetated, becoming less perceptible as it blends with the surrounding vegetation and landform. The long-term changes to the profile of the skyline of Amulsar Mountain, created by the removal of the Erato Mountain peak will be irreversible.		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	High	<b>Major</b> adverse (significant)
Operations Phase: Year 3	High	<b>Major</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	High	<b>Major</b> adverse (significant)
Closure Phase: Year 14	High	<b>Major</b> adverse (significant)
Post-Closure Monitoring Phase: Year 19	High	<b>Moderate</b> adverse (significant)
Night Time Lighting Impacts	High	<b>Major</b> adverse (significant)

**Table 6.5.35: Viewpoint 15: Minor road from Gndevaz to Armenian Silk Road**

Grid Reference: E 555695, N 4400977	Elevation: 2084 m asl (+ 2 m)	
Distance from nearest Project Component: 260 m	Figure 6.5.24: Viewpoint 15: Minor road from Gndevaz to Armenian Silk Road	
<b>Viewpoint Location and Potential Receptors:</b> The viewpoint is located on a minor road which runs between the settlements of Gndevaz on the H-42 road to the west, north-west, and Saralanj on the M-2 road (Armenian Silk Road) to the south-east. Situated in close proximity to the route of the overland conveyor and main access road to the mine, the viewpoint represents views experienced by shepherds, herders and people foraging from the land within the lower reaches of the pastoral landscape of the steppe pasture foothills, and receptors travelling along this minor road between the two settlements. The viewpoint is located within the <i>Lower farmed and settled foothills LCT</i> .		
<b>Description of Existing Views:</b> The viewpoint offers relatively contained views due to the immediate surrounding topography which forms a shallow bowl through which the minor road crosses from north-west to south-east. To the east, pitched views are possible towards the ridge of Amulsar Mountain which forms a linear sequence of summits on the skyline. To the west views towards the steep gorge and settlement of Gndevaz are generally screened by the intervening topography, however more open views west, south-west are possible from sections of the minor road to the north-west and south. Views north towards the settlements of Kechut and Jermuk are contained by the topography which forms the ridge directly north of the viewpoint. The landcover across the area surrounding the viewpoint is predominantly pasture used for grazing, with hay fields extending across mountain meadows. An existing high voltage overhead transmission line is located to the north-west of the viewpoint and runs broadly north to south, forming a key feature in views to the north.		
<b>Sensitivity of Visual Receptors:</b> Herders and people foraging from the land within the surrounding pastoral landscape are judged to be of medium susceptibility to changes in the view, as the setting of the place of work is deemed important to the quality of working life for receptors in this location. Receptors travelling along the minor road between the two settlements are judged to be lower susceptibility to changes in views from this road as they are likely to be focused on the road ahead and the direction of travel. The view from this relatively is deemed to be of local value. The sensitivity of the represented receptors is judged to be <b>medium</b> .		
<b>Description of Visual Impacts:</b> During the construction phase the main access from the H-42 near Gndevaz will be constructed broadly along the alignment of the existing minor road to the location of viewpoint. The overland conveyor will be constructed to the north of the viewpoint, broadly following the vague ridge which runs north-east to south-west and perpendicular to the minor road. Relatively large scale ground works and construction activities will be evident from this viewpoint, and when travelling along the minor road to the north, introducing additional man-made elements into the view occupied by the existing overhead transmission line. More distant views of the haul road on the western side of Amulsar Mountain will also be possible in views to the east from this viewpoint. During the operations phases the open pits will also become perceptible on the distant skyline of Amulsar Mountain to the east, while vehicles moving along the access road directly north of the viewpoint will be visible from the viewpoint and other locations on the minor road to the north. The overland conveyor will remain the most visible component of the Project from this location, as it crosses perpendicular to the minor road. During the winter months dust from the overland conveyor and access road will extend the influence of these components across the adjacent snowfields. Lighting of the Erato open pit, haul road, access road, crushing and screening facility, overland conveyor, along with vehicle movements on site will be perceptible during the hours of darkness from this viewpoint. Lighting will appear across a large proportion of the available view from the viewpoint, due to the proximity to the componentry and will introduce artificial lighting to an area of the foothills which are otherwise unaffected by lighting. The medium-term and reversible visual changes associated with the overland conveyor will be reversed following closure of the mine, removal of the componentry and as disturbed ground is regraded and revegetated. The long-term changes to the profile of the skyline of Amulsar Mountain, created by the removal of the Erato Mountain peak will be irreversible.		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	High	<b>Major</b> adverse (significant)
Operations Phase: Year 3	High	<b>Major</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	High	<b>Major</b> adverse (significant)
Closure Phase: Year 14	Moderate	<b>Moderate</b> adverse (significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> adverse (not significant)
Night Time Lighting Impacts	Moderate	<b>Major</b> adverse (significant)



**Table 6.5.36: Viewpoint 16: Jermuk Church**

<b>Grid Reference:</b> E 557920, N 4407279		<b>Elevation:</b> 2016 m asl (+ 2 m)
<b>Distance from nearest Project Component:</b> 4.7km		<b>Figure 6.5.24:</b> Viewpoint 16: Jermuk Church
<b>Viewpoint Location and Potential Receptors:</b> This viewpoint is located adjacent to the distinctive Jermuk Church which is situated east, south-east of the most southerly extent of the settlement of Jermuk and approximately 2.5km south of the centre of the settlement. The viewpoint is located approximately 4.5 km from the Project-affected area to the south and represents the views experienced by visitors to the church, including both residents of location communities (Jermuk, Kechut etc.) and tourists visiting this local landmark which is easily accessed and viewed from the H-42 to the east. The viewpoint is located within the <i>Forested Upper Gorge and Foothills LCT</i> .		
<b>Description of Existing Views:</b> The church sits in an elevated position west of the H-42 road and offers open views across the valley to the south, towards Kechut to the east and Jermuk to the north. To the east, the topography east of the H-42 road screens longer distance views. Open views towards Amulsar Mountain, and Little Erato are possible from the south side of the church where the viewpoint is located, with Little Erato and the ridge to the west forming the skyline in principal views. The mountain summits of Erato, Tigranes and Artavazdes are not visible from this location. The northern extents of the Project-affected area are visible to the south of the viewpoint, across the north facing slopes of Little Erato and the broad ride to the west.		
<b>Sensitivity of Visual Receptors:</b> Tourists and residents are judged to be of high susceptibility to changes in the view, where views across the surrounding landscape and mountains are the focus of views to the south from this location. Views from this location are judged to be of local value. The sensitivity of the representative receptors is judged to be <b>high</b> .		
<b>Description of Visual Impacts:</b> Construction of the BRSF, the building that contains the crushing and screening facility, truckshop and administration buildings, access roads, and haul road will be perceptible from this location, and the resultant changes will remain throughout the operational phases of the Project. The open pits of Tigranes/Artavazdes and Erato will not be visible from this viewpoint, however as operations and production commences, the BRSF will become more perceptible as it increases in size, appearing above the existing landform of Little Erato, while the run of mine stockpile will become perceptible on the skyline alongside the crushing and screening facility. Dust arising from construction and operation of the Project components will increase perceptibility of the working areas during the late winter/early spring months as the snow fields are discoloured by dust. Lighting of the overland conveyor, crushing and screening facility, truckshop and administration buildings, along with vehicle movements along the access and haul roads on site will be perceptible during the hours of darkness from this location, appearing across the skyline to the south which is otherwise unaffected by artificial lighting. The components visible from this location will occupy a relatively small proportion of the available view in the medium-term. The BRSF will remain following closure of the mine however impacts associated with all other component parts will be reversed once they are removed, including the overland conveyor, crushing and screening facility, truckshop and administration buildings, and access and haul roads. Disturbed ground will be regraded and revegetated to restore the profile and land cover to a resemblance of the baseline situation. The change in landform from the creation of the BRSF will be irreversible and remain long-term, distinguishable on the skyline, however the BRSF will be subject to progressive restoration and will subsequently be capped with topsoil and revegetated, becoming less perceptible within the immediate landscape following the post-closure monitoring phase.		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 3	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	Moderate	<b>Moderate</b> adverse (significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> neutral (not significant)
Night Time Lighting Impacts	Moderate	<b>Moderate</b> adverse (significant)

**Table 6.5.37: Viewpoint 17: West of Kechut Reservoir**

<b>Grid Reference:</b> E 555743, N X4405611	<b>Elevation:</b> 1949 m asl (+ 2 m)	
<b>Distance from nearest Project Component:</b> 4.0km	<b>Figure 6.5.24:</b> Viewpoint 17: West of Kechut Reservoir	
<b>Viewpoint Location and Potential Receptors:</b> This viewpoint is located adjacent to the minor road on the western edge of Kechut reservoir and close to the former Soviet holiday camp (now derelict) to the west of the reservoir. The viewpoint is located in a slightly elevated position alongside the minor road and offers panoramic views to the north-west, east, and south-east across the reservoir, representing views experienced by receptors travelling on the minor road, recreational users of the reservoir and residential receptors at nearby residential properties to the north of the former holiday camp. The viewpoint is located within the <i>Settled lowland and rocky gorges LCT</i> .		
<b>Description of Existing Views:</b> Existing views from this location are focused across Kechut reservoir to the mountain landscapes of the Project-affected area to the south-east. Little Erato is the focal point on the skyline to the south-east, while the broad ridge and small knolls to the west, south-west form a distinguishable skyline which descends towards the H-42 road and Arpa River Gorge. These foothills are generally undeveloped, however the settled lowlands adjacent to the H-42 on the eastern side of Kechut reservoir which form the middle distance of views from this location demonstrate evidence of human influence through the presence of industrial remnants, an electricity substation and overhead transmission lines which cross the broad ridge from north to south east of the highway. Views are possible to the north-west towards the settlement of Kechut and the southern extents of Jermuk. The mountain summits of Erato, Tigranes and Artavazdes, and the HLF site are not visible from this location.		
<b>Sensitivity of Visual Receptors:</b> Tourists and residents are judged to be of high susceptibility to changes in the view, where views across Kechut reservoir to the surrounding landscape and mountains are the focus of views to the east, south-east from this location. The views to the distinct mountain landscape to the east, south-east are judged to be of local value. The sensitivity of the representative receptors is judged to be <b>high</b> .		
<b>Description of Visual Impacts:</b> Construction of the BRSF, the building that contains crushing and screening facility, overland conveyor, truckshop and administration buildings, and access roads will be perceptible from this location, and the resultant changes will remain throughout the operational phases of the Project. The open pits of Tigranes/Artavazdes and Erato will not be visible from this viewpoint, however as operations and production commences, the BRSF will become more perceptible as it increases in size, appearing above the existing landform of Little Erato, while the run of mine stockpile will become perceptible on the skyline alongside the crushing and screening facility. Dust arising from construction and operation of the Project components will increase perceptibility of the working areas during the late winter/early spring months as the snow fields are discoloured by dust. Lighting of the overland conveyor, crushing and screening facility, truckshop and administration buildings, along with vehicle movements along the access and haul roads on site will be perceptible during the hours of darkness from this viewpoint, appearing across the skyline to the east, south-east which is otherwise unaffected by artificial lighting. The components visible from this location will occupy a relatively small proportion of the available view in the medium-term. The BRSF will remain following closure of the mine however impacts associated with all other component parts will be reversed once they are removed, including the overland conveyor, crushing and screening facility, truckshop and administration buildings, and access roads. Disturbed ground will be regraded and revegetated to restore the profile and land cover to a resemblance of the baseline situation. The change in landform from the creation of the BRSF will be irreversible and remain long-term, distinguishable on the skyline, however the BRSF will be subject to progressive restoration and will subsequently be capped with topsoil and revegetated, becoming less perceptible within the immediate landscape following the post-closure monitoring phase.		
<b>Assessment Phase:</b>	<b>Magnitude of Visual Impacts:</b>	<b>Significance &amp; Direction of Visual Effects:</b>
Construction Phase: Year -1	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 3	Moderate	<b>Moderate</b> adverse (significant)
Operations Phase: Year 10 – Max. Case Scenario	Moderate	<b>Moderate</b> adverse (significant)
Closure Phase: Year 14	Low	<b>Minor</b> adverse (not significant)
Post-Closure Monitoring Phase: Year 19	Low	<b>Minor</b> neutral (not significant)
Night Time Lighting Impacts	Moderate	<b>Moderate</b> adverse (significant)



#### **6.5.21 Mitigation of Residual Effects during Detailed Design**

Each of the proposed Project components will be subject to future detailed engineering design iterations in consultation with the relevant specialist consultants in an attempt to reduce the identified landscape and visual effects. It is considered that through further detailed engineering design, a number of the identified effects can potentially be mitigated further.

#### **6.5.22 Landscape Enhancement Measures**

Where identified landscape and visual effects cannot be potentially mitigated, implementation of subsequent landscape and habitat enhancement measures elsewhere may be adopted to reduce the overall impact of the Project. Such measures will be developed by Lydian in conjunction with the appropriate specialist consultants and be detailed within the final ESMP (Chapter 8), pMRCRP (Appendix 8.18) and BAP (Appendix 8.20); all landscape design measures will also take account of the requirement in the BMP (Appendix 8.21).

#### **6.5.23 Monitoring and Audit of Residual Landscape and Visual Effects**

The level of significance of each reported landscape and visual effect is dependent on the complete and successful implementation and monitoring of embedded mitigation and restoration measures at each appropriate phase of the Project. These mitigation and restoration measures are outlined earlier (Section 6.5) and described in more detail in the FMP (see Appendix 8.8) and pMRCRP (see Appendix 8.18).

To ensure that the proposed mitigation and restoration measures are implemented successfully, it is envisaged that a number of supplementary Standard Operating Procedures (SOPs) will be developed and which will outline appropriate construction, restoration and rehabilitation methods and practices to be adhered to throughout the construction, operation and closure phases of the Project.

#### **Method Statements and SOPs**

Lydian will develop method statements and SOPs in conjunction with appointed contractors, which shall explicitly describe the role of the qualified landscape architect and the landscape/environmental clerk of works for all phases of the project. These will also be referenced within the final pMRCRP (see Appendix 8.18) and BMP (see Appendix 8.21). The method statements shall include, but shall not be limited to, the following activities:

- Species protected by statute<sup>12</sup>;
- Management and protection of existing vegetation;
- Construction of protective fencing, for vegetation and wildlife;
- Clearance of vegetation;
- Ground preparation and turf/soil stripping;
- Earthworks and landform grading;
- Preparation and cultivation of soils for planting and seeding;
- Seeding (including of trees and shrubs), and promotion of natural regeneration;
- Planting, including of trees and shrubs; and
- Monitoring, management and maintenance of restored areas.

### ***On-site Monitoring***

In order to ensure SOP compliance and the successful implementation of mitigation and restoration measures, it is suggested that all Project site area works should be overseen by a qualified environmental or landscape clerk of works, who will consult with external specialists (i.e. qualified landscape architect) as required. Regular site inspections to ensure compliance with committed mitigation, rehabilitation and restoration plans in accordance with an agreed schedule will be required throughout the construction, operation and closure phases of the Project, and also include regular inspection during the Post-Closure Monitoring Phase, to ensure any remedial treatment for unsuccessful mitigation and restoration measures is devised and implemented. Any deviations from agreed mitigation and restoration measures will be highlighted, and remedial actions implemented. Aftercare requirements for managing the landscape works to the end of the Post-Closure Monitoring Phase of the Project will be included in the final pMRCRP (see Appendix 8.18).

Lydian will ensure that a qualified landscape architect shall visit the Project Site at suitably regular intervals in accordance with an agreed schedule<sup>13</sup> and the environmental clerk of works will attend the site whilst the following works are being carried out:

- Identification of vegetation to be protected or removed;
- Topsoil stripping;
- Earthworks and grading of landform;

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<sup>12</sup> To be overseen in conjunction with an Ecological Clerk of Works.

<sup>13</sup> An agreed monitoring schedule will be developed, with regular site inspections by appropriately qualified professionals being undertaken regularly (e.g. every 2 months) during the construction, operation and closure phase, and at least once annually during the post-closure monitoring phase until all areas are restored to the satisfaction of the competent authority.

- Breaking out redundant surfaces;
- Subsoil ripping;
- Spreading of soil;
- Cultivation;
- Preparation for seeding and planting; and
- Seeding and planting.

#### **6.5.24 Summary of Residual Effects**

During construction of the Project components, there will be disturbance to the landscape arising from construction activities, both within the Project-affected area and across the surrounding local area, as a result of changes being seen from areas beyond the Project-affected area. Direct effects will occur along the main access roads to the north-east and west of Amulsar Mountain, and at the sites of the BRSF, the HLF, the haul road, the buildings that contain the crushing and screening facility, the route of the overland conveyor and utilities corridor, the ADR plant and other associated infrastructure, such as the truckshop and administration facilities platform, resulting in localised significant effects on the landscape of the *Lower Farmed and Settled Foothills, High Steppe and Plateau Grassland, Highland Hills and Grazing* and *High Rocky Peaks*. These, construction related effects, will be short to medium-term occurring during the construction works, and for a period of time following completion of the construction phase, whilst the disturbed land outside the Project component footprint is returned to its original condition, and replacement vegetation, which is planted or encouraged to regenerate post construction, becomes established.

Once the operational phases of the Project begin, significant landscape effects will extend to a larger proportion of the *High Rocky Peaks LCT* as the open pits are created and operational activities start. During the operation and production phases of the Project (see Table 6.5.10), significant landscape effects will be limited to the directly affected areas and the immediate areas which surround the key Project components, as the presence of large man-made structures and disturbance will lead to consequential changes in the character of the adjacent and surrounding areas. These effects will diminish with distance from the Project-affected area, and although the wider landscape will be indirectly affected, no significant effects on the wider landscape are anticipated.

The assessment indicates that significant residual effects on views will occur. These will largely result when both close and longer range open views of the Project components affect visual receptors of high sensitivity, within close proximity to the Project-affected area, or in

locations where the existing view is particularly highly valued. Significant effects on views are therefore identified from the Top of Jermuk Ski Lift, Hotel Olympia in Jermuk, Hotel Armenia in Jermuk, the Deer Sculpture west of Jermuk, the western edge settlement of Gndevaz, from Little Erato, the minor road between Gndevaz and Saralanj, Jermuk Church and from west of Kechut Reservoir. There will also be significant effects on people travelling along the H-42 between the M-2 highway and Jermuk and the minor road through the Vorotan Valley. The majority of these significant effects will be experienced throughout the construction, and operation and production phases of the Project, with most diminishing over time through the closure and post-closure monitoring phases of the Project.

As vegetation becomes re-established in the longer term, landscape and visual effects may be regarded as neutral in some instances, in that the landscape and views will remain permanently altered, but the application of mine closure and rehabilitation measures will mean that these areas will gradually be seen to blend back into the surrounding landscape.

Some views from the tourist resort of Jermuk will be significantly affected by the Project during both the construction and operations phases of the Project, with visibility of the crushing and screening facility and ancillary components to the north possible, and when the BRSF will be at its largest extent, however these impacts will reduce following closure, removal of infrastructure and successful restoration and rehabilitation of the BRSF site. The settlement of Gorayk, and the majority of residential properties within the settlements of Jermuk, Kechut, Gndevaz, Saravan and Saralanj will have no or very limited visibility of the Project components.

The Project components have been designed to reduce significant landscape and visual effects, reducing visibility from sensitive receptors and where possible integrating them into the landscape. Landscape enhancement measures will be incorporated into the FMP (see Appendix 8.8) and pMRCRP (see Appendix 8.18), to offer landscape and habitat benefits in the long-term while providing mitigation of potential landscape and visual effects during the operations phases of the Project.

Overall, the Project will result in significant residual effects on landscape and visual receptors, however these effects will be largely localised, commonly occurring within approximately 5 km of the Project-affected area. Many of the significant landscape and visual effects identified will be short to medium-term and will become neutral following the cessation of operations, removal of Project components and implementation of closure restoration and

rehabilitation measures and post-closure monitoring. Significant landscape and visual effects arising from the open pits, HLF and BRSF will be permanent, albeit that many will reduce in significance over time, with some remaining following the post-closure monitoring phase of the Project. As the rock weathers, and vegetation returns, the changes will become progressively less apparent.

Through the next phase of more detailed design there may be potential to reduce further still the residual landscape and visual effects identified within the assessment. The detailed design of project components will be undertaken with reference to the mitigation measures outlined within this chapter and delivered within the engineering and operational parameters which are possible. As such, unless explicitly stated within the assessment, commitment to additional specific mitigation measures has not yet been made and has therefore not been considered when assigning levels of landscape and visual effect. The assessment therefore represents a maximum case effect scenario.

Cumulative landscape and visual effects are addressed in Chapter 7.

#### **6.5.25 Summary Table of Residual Landscape and Visual Effects**

Table 6.5.38 below summarises the potential landscape and visual effects identified in the assessment.

**Table 6.5.38: Summary Table of Residual Landscape and Visual Effects**

Receptor/ Representative Viewpoints	Significance and Direction of Effect					
	Construction Phase: Year -1	Operations Phase 1: Year 3	Operations Phase 2: Year 10 - Maximum Case Scenario	Closure Phase: Year 14	Post-Closure Monitoring Phase: Year 19	Night Time - Lighting Impacts
<b>Landscape Receptors</b>						
<i>Settled Lowland and Rocky Gorges</i>	Negligible - adverse	Minor - adverse	Minor - adverse	Minor - adverse	Minor - neutral	n/a
<i>Lower Farmed and Settled Foothills</i>	<b>Moderate</b> - adverse	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Moderate</b> - neutral	n/a
<i>Forested Upper Gorge and Foothills</i>	Minor - adverse	Minor - adverse	Minor - adverse	Minor - adverse	Negligible - neutral	n/a
<i>High Steppe and Plateau Grassland</i>	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	<b>Minor</b> - adverse	Minor - neutral	n/a
<i>Highland Hills and Grazing</i>	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Moderate</b> - neutral	n/a
<i>High Rocky Peaks</i>	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Major</b> - adverse	n/a
<b>Visual Receptors - Representative Viewpoints</b>						
<i>VP 1: Top of Jermuk Ski Lift</i>	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	Minor - adverse	Minor - neutral	<b>Moderate</b> - adverse
<i>VP 2: Hotel Olympia, Jermuk</i>	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	Minor - adverse	Minor - neutral	<b>Moderate</b> - adverse
<i>VP 3: Hotel Armenia, Jermuk</i>	Minor - adverse	Minor - adverse	<b>Moderate</b> - adverse	Minor - adverse	Minor - neutral	<b>Moderate</b> - adverse
<i>VP 4: Deer Sculpture west of Jermuk</i>	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	Minor - adverse	Minor - neutral	<b>Moderate</b> - adverse
<i>VP 5: Western edge of Gndevaz Village</i>	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	Minor - adverse	Minor - adverse	<b>Moderate</b> - adverse
<i>VP 6: H-42 highway south of Gndevaz</i>	<b>Moderate</b> - adverse	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Moderate</b> - adverse	Minor - adverse	<b>Major</b> - adverse
<i>VP 7: H-42 highway South-west of Heap Leach Facility</i>	Minor - adverse	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	Minor - adverse	<b>Moderate</b> - adverse
<i>VP 8: Armenian Silk Road (M-2 highway) near Junction with the H-42 highway</i>	Negligible - adverse	Minor - adverse	Minor - adverse	Minor - adverse	Negligible - neutral	Negligible - adverse

**Table 6.5.38: Summary Table of Residual Landscape and Visual Effects**

Receptor/ Representative Viewpoints	Significance and Direction of Effect					
	Construction Phase: Year -1	Operations Phase 1: Year 3	Operations Phase 2: Year 10 - Maximum Case Scenario	Closure Phase: Year 14	Post-Closure Monitoring Phase: Year 19	Night Time - Lighting Impacts
VP 9: Armenian Silk Road (M-2 highway) in Saralanj village	Minor - adverse	Minor - adverse	Minor - adverse	Minor - adverse	Negligible - neutral	Minor - adverse
VP 10: North end of Ughedzor Village	Minor - adverse	Minor - adverse	Minor - adverse	Minor - adverse	Negligible - neutral	Minor - adverse
VP 11: Syunik Gates on the Vorotan Pass (M-2 highway) between Saravan and Goryak	Negligible - adverse	Minor - adverse	Minor - adverse	Minor - adverse	Negligible - neutral	Minor - adverse
VP 12: Armenian Silk Road (M-2 highway) between Tsg huk and Gorayk	Negligible - adverse	Minor - adverse	Minor - adverse	Minor - adverse	Negligible - neutral	Minor - adverse
VP 13: Minor road through Vorotan Valley	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	<b>Major</b> - adverse	<b>Moderate</b> - adverse	Minor - adverse	<b>Major</b> - adverse
VP 14: Little Erato	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Moderate</b> - adverse	<b>Major</b> - adverse
VP 15: Minor road from Gndevaz to Armenian Silk Road	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Major</b> - adverse	<b>Moderate</b> - adverse	<b>Major</b> - adverse
VP 16: Jermuk Church	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	Minor - adverse	Minor - adverse	<b>Moderate</b> - adverse
VP 17: West of Kechut Reservoir	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	<b>Moderate</b> - adverse	Minor - adverse	Minor - adverse	<b>Moderate</b> - adverse