

CONTENTS

| | |
|---|---------------|
| 6.15 Land use, Agriculture and Natural Resources | 6.15.2 |
| 6.15.1 Assessment Criteria..... | 6.15.3 |
| 6.15.2 Potential Impacts | 6.15.5 |
| 6.15.3 Monitoring and Audit..... | 6.15.10 |
| 6.15.4 Conclusions | 6.15.12 |

TABLES

| | |
|---|---------|
| Table 6.15.1: Land Take Impacts by Rural Community..... | 6.15.3 |
| Table 6.15.2: Receptor Sensitivity Scale | 6.15.4 |
| Table 6.15.3: Project Land Take by Component | 6.15.5 |
| Table 6.15.4: Loss of Agricultural Land per Cadastre Categorisation | 6.15.6 |
| Table 6.15.6 Loss of Pasture Land (including lands classified as mining land) | 6.15.7 |
| Table 6.15.7: Impact Assessment, Loss of Agricultural Land Impacts | 6.15.10 |
| Table 6.15.8: Mitigation Summary Table..... | 6.15.11 |

FIGURES

| | |
|--|---------|
| Figure 6.15.1: Footprint, Disturbed and Restricted | 6.15.13 |
|--|---------|

6.15 Land use, Agriculture and Natural Resources

The development of the Amulsar Project will require 1,399 ha to have restricted access during the life of the Project, and will be largely unavailable for access by nearby communities and seasonal herders. Land impacts are classified into five categories (see Figure 4.12.3):

- Footprint – the physical footprint of the Project’s facilities as defined in Figure 3.1;
- Disturbed area – The area of land that comprises the project footprint plus the immediately adjacent land that is expected to be affected as a consequence of both construction (disturbance of topsoil) and operations (as a consequence of deposition of dust on vegetation, thereby reducing the value of agricultural land);
- Restricted area (through operations) – A buffer zone that has been defined around the limits of each of the open pits (Tigranes, Artavazdes and Erato) within which land use will be restricted as a consequence of mining operations, mainly for safety reasons during blasting;
- Restricted Area (through fencing) – Additional areas of land, within which use will be restricted due to fencing that defines the perimeter of mining operational land;
- Restricted Area (ecological) – Areas of land, within which it is predicted that the presence of mine infrastructure (including access roads and the conveyor) may inhibit use by fauna, including livestock.

The footprint of the project will cover 609 ha, with a disturbed area of 930 ha and further restricted areas totalling 477ha¹.

The project requires land acquisition that has been based on negotiated settlement, with a number of plots through expropriation, as detailed in the LALRP publicly disclosed in February 2015 and the Addendum to the LALRP disclosed in March 2016 (see Appendix 8.23).

The following number of privately owned land plots are affected by the Project:

- Phases 1-3 of land acquisition affect 252 private land plots, affecting 150 households, covering an area of 138.9ha.
- Phase 4 of land acquisition will affect an additional 22 private land plots, impacting 20 households (17 of these households are affected as part of Phase 1 -3 land acquisition as well), covering an area of 13 ha.

¹ Please note this figure is different from that reported in Section 6.11 Biodiversity where an additional area is included in the disturbance calculation. Please see Chapter 6.11 for further details.

- One household will be physically displaced, through a negotiated agreement. The property will be used by the project as a primary monitoring station for noise, dust, ground vibration and air overpressure, together with office facilities and scope for participatory monitoring.

This Section provides an assessment of the impacts to the land and agricultural resources. It provides the context upon which Section 6.16 then undertakes the analysis of how these impacts affect livelihoods. Similarly, this section provides the context for the assessment of ecosystem services impacts (Section 6.20) linked to land loss or reduced access. By providing this context in a separate section, it allows for all the land impacts to be presented once in a comprehensive manner.

The Project will affect the land holdings of three rural communities: Gorayk, Saravan and Gndevaz. Jermuk will not be affected by the Project's need for land. The proportion of land taken varies considerably between the communities, as indicated in Table 6.15.1 and shown in Figure 4.12.3 (reproduced below).

| Rural Community | Disturbed (ha) (includes footprint and deposition zone) | Restricted Areas (ha) | Disturbed plus restricted areas (ha) | % of community lands disturbed plus restricted access |
|------------------------|--|----------------------------------|---|--|
| Gndevaz | 759 | 184 | 935 | 15% |
| Saravan | 70 | 128 | 199 | 3% |
| Gorayk | 109 | 165 | 274 | 1% |
| Total | 930 | 477 | 1399 | |

6.15.1 Assessment Criteria

To assess the significance of potential impacts upon agricultural land, the methodology described in Section 6.2.2 has been used. This approach has been used due to the relevance of sensitivity of the receptor for this analysis, and it is consistent with the analysis used in many of the environmental sections. This assessment considers the direct and indirect loss of land to agricultural use, as a consequence of the Project. The consequences of this loss of land upon livelihoods are addressed in Section 6.16. The consequences of this loss of land or access to agricultural land upon ecosystem services are addressed in Section 6.20. The potential impacts considered in this section include:

² Data sourced from Armenian Cadastre in August 2014.

- Loss of agricultural land (including pasture and grazing land), as a consequence of soil disturbance; and
- Loss of agricultural land (including pasture and grazing land), as a consequence of restricted access.

Loss of agricultural land can result from the removal of soils during the development phase of the Project. During the operational phase the soil quality may be subject to change as a consequence of dust deposition and vehicle exhaust emissions.

Loss of agricultural land can also result from restricted access zones (as described earlier). This includes areas which are physically fenced, as well as areas which will not be fenced but to which access will be deterred through other measures, including extensive consultation with affected communities (e.g. operational safety buffers around the open pits during blasting). The sensitivity of these receptors has been considered in Section 6.8, and the sensitivity scale in Table 6.15.2 aligns with this assessment.

| Table 6.15.2: Receptor Sensitivity Scale | | |
|---|--------------------------------|--|
| | Sensitivity of receptor | Loss of agricultural land and restricted access to farmland |
| 1 | Minor | Non agricultural land or land that infrequently supports low intensity grazing or other non commercial crops |
| 2 | Medium | Agricultural land suitable for a range of annual crops, with a regional importance in terms of production. |
| 3 | High | Agricultural land suitable for a wide range of agricultural and horticultural crops, nationally important for food production. |
| 4 | Very High | Agricultural land suitable for high value agriculture and horticulture supporting export products. |

6.15.2 Potential Impacts

Project Activities Affecting Loss of Agricultural Land

The Project will disturb approximately 930 ha of agricultural land available to nearby communities during the operational period. An additional 477 ha will have restricted access, although the land will not be disturbed.

Table 6.15.3 Table 6.15.3 indicates the land take per component of the project.

| Project Component | Footprint (ha) | Disturbed Area (ha) | Restricted area (ha) |
|--|-----------------------|----------------------------|-----------------------------|
| Tigranes - Artavazdes Open Pit | 96.8 | 26.4 | 323.2 |
| Erato Open Pit | 40.5 | 6.2 | |
| Barren Rock Storage Facility including Landfill, Contact Water Pond and Explosives Magazines | 139.2 | 22.8 | 59.5 |
| Construction Camp | 6.3 | 41.7 | - |
| Overland Conveyor and Discharge Structure | 19.3 | 57.4 | 94.5 |
| Heap Leach Facility and Ancillary Infrastructure | 165.5 | 37.3 | |
| Primary, Secondary and Tertiary Crusher | 13.9 | - | - |
| Haul and Access Roads | 78.8 | 121.0 | - |
| Facilities platform | 6.1 | 5.6 | |
| Quarries | 9.1 | 4.3 | |
| Misc. Stockpiles, Landfill Laydown Areas & Ponds | 31.8 | - | |
| Total Areas | 609 | 322.7 | 477.2 |

As described in Chapter 3, the Project design includes a 5.6km long overland conveyor to transport ore from the crusher to the truck load-out facility near the HLF. In order to minimise restrictions to access caused by this conveyor, a series of crossings will be constructed to allow herders, their livestock and equipment (including a combine harvester) to access lands on both sides of the conveyor.

The baseline presented information on permitted land use as reported by the Armenian cadastre. The cadastre evaluation represents the greatest economic use which is anticipated for different areas. For example, land categorised as “pasture” is considered by the cadastre to be of a lower quality than “arable land”. During the development period of the Project, significant areas within the Project footprint have been reclassified as “mining lands” as is required for the permitting process. For the purposes of this assessment, however, all land

³ Data derived from GIS mapping completed by Lydian linked to engineering design plans

is considered to be agricultural in nature, as this land re-classification would not have occurred in the absence of the Project. Minor areas of non-agricultural and non-mining land did exist within the Project footprint prior to the Amulsar Project, however they are negligible compared to the scale of land changes described here.

A verification assessment was undertaken in 2013 to determine the correlation between cadastral classifications and actual use of the land. The survey confirmed that the large majority of land categorisation was accurate.

Potential Loss of Agricultural Land Impacts

Table 6.15.4 summarises the loss of agricultural land per rural community. The assessment captures the major land categorisations only, and is based upon land classifications as reported by the Cadastre in 2014. As a result, the land categorisations already include some land which has been converted from its original categorisation to “mining land”. To ensure a conservative approach has been taken in this analysis, it has been assumed that all land currently categorised as “mining land” was formerly considered to be “pasture land”. As such, a subsequent table has been added which highlights the loss of pasture land, including lands now classified as mining land.

| Community | | Gndevaz | Gorayk | Saravan |
|------------------|-------------------|----------------|---------------|----------------|
| Arable land (ha) | Disturbed | 75.3 | - | - |
| | Restricted | 2.8 | - | - |
| | Available | 461.2 | 1727.76 | 381.81 |
| | % loss disturbed | 16.3 | - | - |
| | % loss restricted | 0.6 | - | - |
| Hayfields (ha) | Disturbed | 14.9 | - | - |
| | Restricted | 10.3 | - | - |
| | Available | 115.6 | 860 | 400 |
| | % loss disturbed | 12.9 | - | - |
| | % loss restricted | 8.9 | - | - |
| Garden (ha) | Disturbed | 8.65 | - | - |
| | Restricted | - | - | - |
| | Available | 24.3 | - | - |
| | % loss disturbed | 35.6 | - | - |
| | % loss restricted | - | - | - |

⁴ Calculations completed by Lydian based upon Cadastre data

| Community | | Gndevaz | Gorayk | Saravan |
|------------------------------|-------------------|----------------|---------------|----------------|
| Irrigated arable land (ha) | Disturbed | 12.7 | - | - |
| | Restricted | - | - | - |
| | Available | 124.3 | - | 10.0 |
| | % loss disturbed | 10.2 | - | - |
| | % loss restricted | - | - | - |
| Mining land (ha) | Disturbed | 160.5 | 109.4 | 67.2 |
| | Restricted | 40.6 | 164.8 | 128.4 |
| | Available | 324.4 | 1646.2 | 1010.6 |
| Other agricultural land (ha) | Disturbed | 83.4 | - | - |
| | Restricted | 21.9 | - | - |
| | Available | 421.9 | 3324.8 | 1249.3 |
| | % loss disturbed | 19.8 | - | - |
| | % loss restricted | 5.2 | - | - |
| Pasture (ha) | Disturbed | 394.9 | - | - |
| | Restricted | 117.5 | - | - |
| | Available | 4501.1 | 13477.8 | 4323.2 |
| | % loss disturbed | 8.8 | - | - |
| | % loss restricted | 2.4 | - | - |

| Community | | Gndevaz | Gorayk | Saravan |
|--------------------------|-------------------|----------------|---------------|----------------|
| Pasture Plus Mining (ha) | Disturbed | 564.4 | 109.4 | 67.2 |
| | Restricted | 149.1 | 164.8 | 128.4 |
| | Available | 4825.5 | 15124.0 | 5333.7 |
| | % loss disturbed | 11.7 | 0.7 | 1.3 |
| | % loss restricted | 3.1 | 1.1 | 2.4 |

Based on this assessment, Gndevaz will lose more agricultural land than the other rural communities. The greatest proportional losses in Gndevaz will be in the garden land category (36% loss of access to garden lands). Gndevaz will also lose access (combining disturbed areas and access restricted areas) to 25% of lands classified as “other agricultural”. The loss of access (including disturbed and restricted access areas) to arable land, hayfields, pasture (including land classified as mining in 2014) and irrigated arable land is less than 20% in Gndevaz.

⁵ Calculations completed by Lydian based upon Cadastre data

Proportionally (in comparison to land available per category per community), Gorayk and Saravan will lose (through disturbance and access restrictions) relatively small areas. If the mining land is considered to be pasture land, then the greatest impact will occur in a loss of pasture lands (approximately 1% in Gorayk and 2% in Saravan).

The post-rehabilitation availability of land will need to be confirmed during the Project operational period, through the assessment of bio-accumulation in different species. The BRSF and HLF areas will be re-profiled and covered with a cap and vegetative cover. Taking a conservative approach, it is possible that these lands will not be available for the same agricultural purposes post mine closure as they were pre-mining.

Drawing on this assessment, the un-mitigated impact to agricultural land from soil disturbance is considered to be a long-term adverse impact on a receptor of medium sensitivity. This would result in a moderate adverse impact which would be considered to be significant.

The un-mitigated impact to agricultural land from the restriction of access is considered to be a short-medium term positive impact on a receptor of medium sensitivity. This is because the restriction of access of livestock to the land may allow it to improve over a number of years. Long-term, the restriction of access will have a negligible change to the agricultural land, and would result in a negligible impact which would not be considered to be significant. This assessment considers the impacts to the land and does not address the impacts to land users affected by these restrictions (see Section 6.16)

Mitigation Measures for Loss of Agricultural Land

The Project has been designed to minimise its footprint wherever possible, and opportunities for further footprint reduction will be sought during the detailed design and engineering processes. The design process has also sought to maintain access to agricultural land where it is safe for project staff and community members to do so. Land will only be fenced off when it is necessary to do so and access crossings will be put in place to maintain access over linear features.

Footprint minimisation is evident in the design of the conveyor structure. A number of crossing points have been designed into the facility. It is intended that herders, their livestock and equipment (including vehicles and a combine harvester) and potentially some wildlife will

be able to use these crossing points to ensure that access on both sides of the conveyor is maintained. During the detailed design phase, consultation with communities, herders, engineers and biodiversity specialists will be undertaken to ensure the crossing points are placed as close as possible to current livestock routes used by the daily herders from Gndevaz and seasonal herders more broadly.

Land will be rehabilitated as part of the mine closure plan. Assessments of the final land quality targeted as part of the closure programmes will be developed once seed trials have been advanced and once community consultation has occurred. The pMRCRP outlines the planned rehabilitation and re-vegetation activities which will be undertaken by the Project. Despite best efforts, some areas of land will not be rehabilitated to their original state for the purposes of agricultural use. These are likely to include:

- The Erato, Tigranes and Artavazdes open pits will not support agricultural use post closure;
- The HLF will be leached with barren solution to extract residual gold and silver, and will then be rinsed so that residual cyanide is destroyed. It will subsequently be capped following the conclusion of mining. It will also be re-contoured to better fit the natural environment in a post-closure setting. Chemical bio-availability studies will be conducted prior to the final design for rehabilitation options (at least 5 years before closure) in the future to determine appropriate and safe future use of the land;
- The BRSF will also be revegetated and re-contoured to better fit the natural environment in a post closure setting. The final state of the land will again depend on the results of bio-accumulation studies which will be undertaken during the operational period; and
- Land impacted by dust deposition is expected to return to pre-existing agricultural condition within a few years of the cessation of road traffic and dust generated by the Project.

Residual Loss of Agricultural Land Impacts

Through implementation of the mitigation measures outlined above, the short and long term residual impacts are considered to be moderate (negative) for land which is disturbed, some of which will not be returned to its previous condition. Table 6.15.6 summarises Project impacts on agricultural land.

| Table 6.15.6: Impact Assessment, Loss of Agricultural Land Impacts | | | | | | |
|---|------------------|------------------|--------------------|-----------------|-----------------------|----------------------|
| Sub-category | Direction | Magnitude | Sensitivity | Duration | Impact (prior) | Impact (post) |
| Soil Disturbance | Negative | Moderate | High | Long-Term | Major (negative) | Moderate (negative) |
| Restriction of access | Positive | Low | Medium | Short-term | Minor (positive) | Minor (positive) |
| Restriction of access | Negative | Low | Medium | Long-term | Minor (negative) | Minor (negative) |

6.15.3 Monitoring and Audit

As described, mitigation measures that relate to managing agricultural land impacts will be addressed through both social and environmental management plans. Monitoring and audit requirements have been addressed in Section 6.8.

Table 6.15.7: Mitigation Summary Table

| Section | Mitigation | Monitoring Indicator | Management Plan |
|--|---|---|--|
| 6.12.2 Soil disturbance and physical barriers | <ul style="list-style-type: none"> • Project footprint will be minimised where possible • Access to land adjacent to Project affect area will be maintained where it is safe to do so • Rehabilitation trials to determine how best to enhance soil quality as part of mine closure process and return land for grazing use in the long term | Footprint disturbed Footprint rehabilitated | Footprint Management Plan Livelihood Restoration Plan |
| 6.12.2 Restriction of Access | <p>Minimisation of restricted access where safe to do so</p> <p>Consultation with communities, herders, engineers and biodiversity specialists will be undertaken to ensure the crossing points are placed as close as possible to current livestock routes used by the daily herders from Gndevaz and seasonal herders more broadly.</p> <p>Monitoring of land users (see Section 6.16) to assess impacts caused by restricted access to pasture and grazing land, with identification of additional mitigations as necessary.</p> | Quantification of restricted area Community grievances | Footprint Management Plan Preliminary Mine Reclamation, Closure and Rehabilitation Plan (pMRCRP) Livelihood Restoration Plan |

6.15.4 Conclusions

The impact assessment has been carried out to assess the impacts on agricultural land due to the Project's activities. Findings are summarised below:

- Impacts fall into two main categories: loss of agricultural land due to soil disturbance; and loss of agricultural land through medium term access restrictions.
- This section provides the basis upon which impacts to livelihoods and ecosystem services can then be derived (Sections 6.16 and 6.20 respectively).
- The Footprint Management Plan has been developed to minimise the footprint of the Project and ensure agricultural land is returned to as close to its original condition where possible. This will likely be impossible at the HLF site where land quality will be permanently reduced.

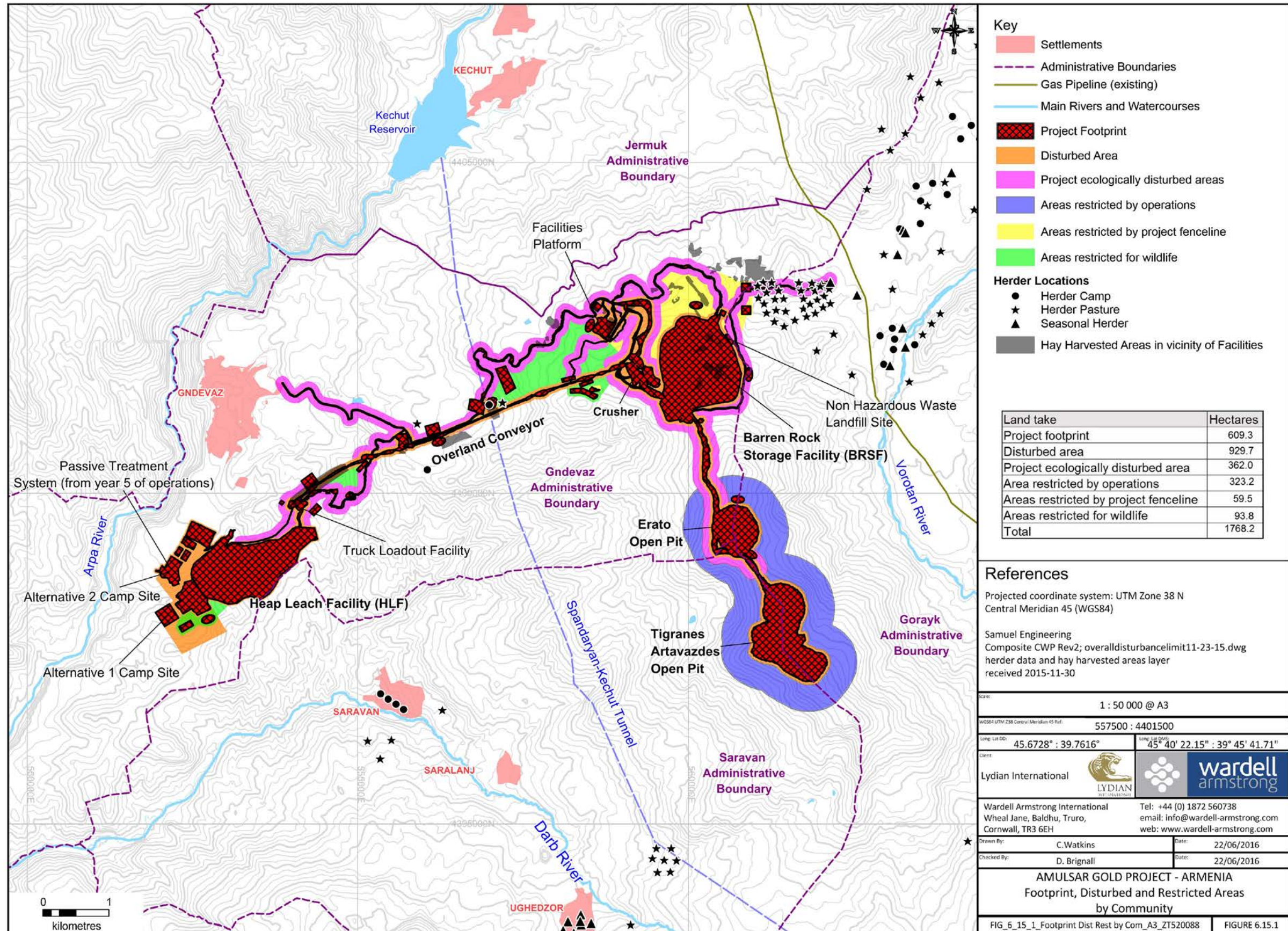


Figure 6.15.1: Footprint, Disturbed and Restricted by Areas of Community

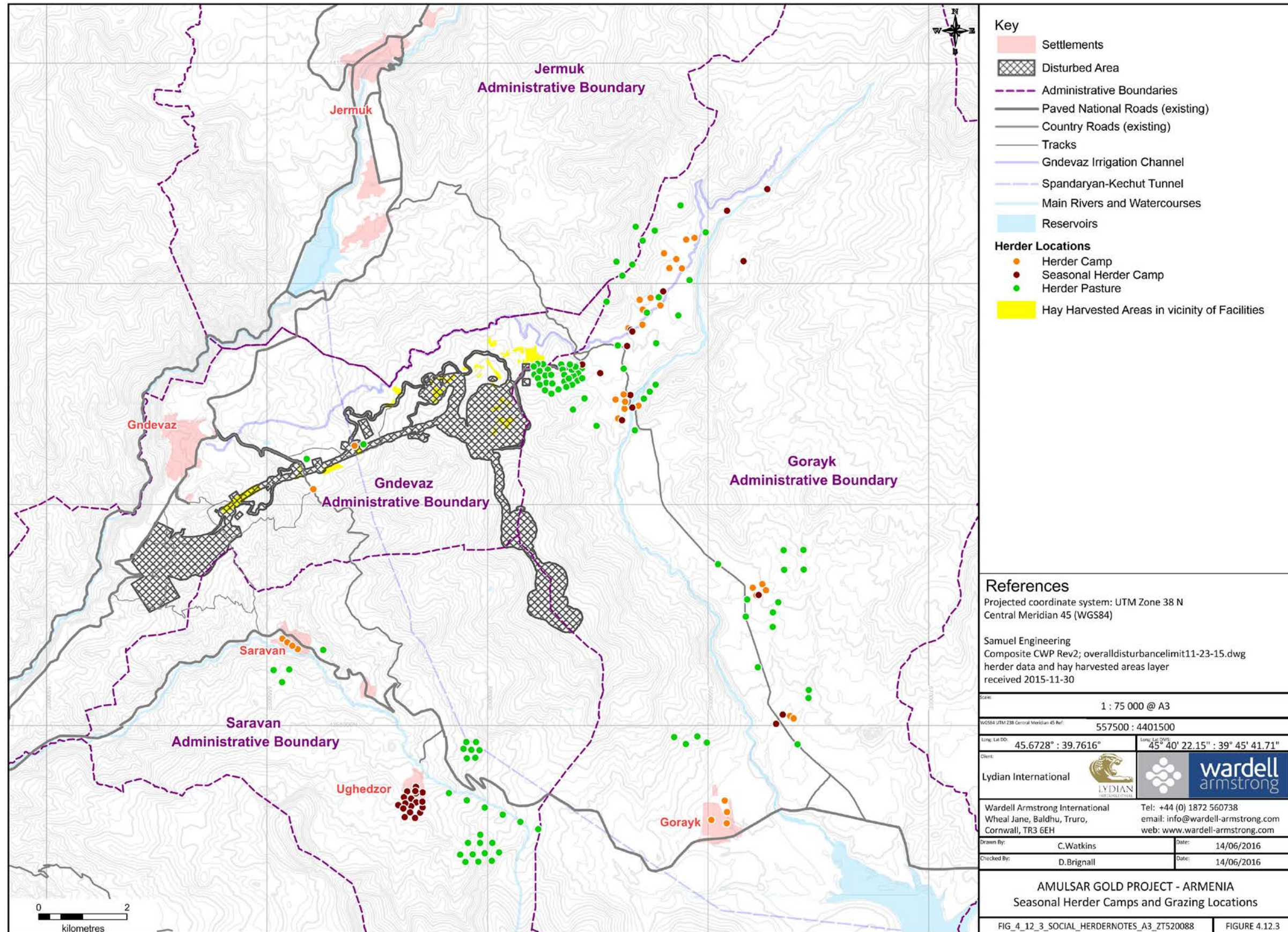


Figure 4.12.3: Seasonal Herder Camps and Grazing Locations