REPORT

Non-Technical Summary for the ESHIA for appraisal well Shpirag-5 in Blocks 2-3 Albania

Part of the of Environmental, Social and Health Impact Assessment Process of Shpirag-5 appraisal well

Client: Shell Upstream Albania B.V.

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Acronyms

APS	Appraisal Pilot System
CLO	Community Liaison Officer
EIA	Environmental Impact Assessment
EMMP	Environmental Management and Monitoring Plan
ERP	Emergency Response Plan
ESMS	Environmental and Social Management System
ESHIA	Environmental, Social and Health Impact Assessment
ESIA	Environmental and Social Impact Assessment
H_2S	Hydrogen Sulphide
HSSE	Health, Safety, Security and Environment
IA	Impact Assessment
IFC	International Finance Corporation
MIE	Ministry of Industry and Energy
MTE	Ministry of Tourism and Environment
NEA	National Environment Agency
OBM	Oil-based Muds
PSC	Production Sharing Contract
RHDHV	Royal HaskoningDHV
SEP	Stakeholder Engagement Plan
SP	Social Performance
SUA	Shell Upstream Albania BV
WBM	Water-based muds

1 Introduction

1.1 Purpose of the Non-Technical Summary

This document constitutes a non-technical summary (NTS) of the Environmental, Social and Health Impact Assessment (ESHIA) for the proposed project Appraisal Well Shpirag-5 in Blocks 2-3 Albania. It is submitted as part of the project disclosure package together with the ESHIA Report and the Stakeholders Engagement Plan to the national Environmental Agency (NEA) and the Ministry of Tourism and Environment (MTE) to provide a summarized overview of the results and it is a base document for the public disclosure. The document presents the project, a description of the current state of physical, biological and human environment in the project area, key environmental and social impacts, and details the measures planned to prevent, minimize, mitigate or offset these impacts. The NTS follows the same structure as the Environmental, Social, Health Impact Assessment report.

The ESHIA has been prepared by an independent team of consultants of Royal HaskoningDHV (Headquarters in Amersfoort, the Netherlands) and EMA Consulting (based in Tirana, Albania) appointed by Shell Upstream Albania B.V. The ESHIA has been developed in accordance with the Environmental Impact Assessment regulation and standards applicable in Albania, to European Union standards and according to International Financing Corporation standards (IFC) and Shell standards.

1.2 Summary of the Shpirag-5 project

Shell Upstream Albania B.V. (hereafter referred to as Shell) is the Operator of the Production Sharing Contract (PSC) of Blocks 2-3 onshore Albania. Shell plans to conduct the drilling of the Shpirag-5 appraisal well in Blocks 2-3, near the village of Konisbalte, located in the Ura Vajgurore Municipality. The proposed Shpiag-5 site of estimate 2 hectares is located close to SUA's existing well site and Shpirag 2/4 and worker camp. Two alternative sites for the Shpirag-5 appraisal well are considered in the ESHIA. But in this NTS we will focus on the Preferred Alternative.

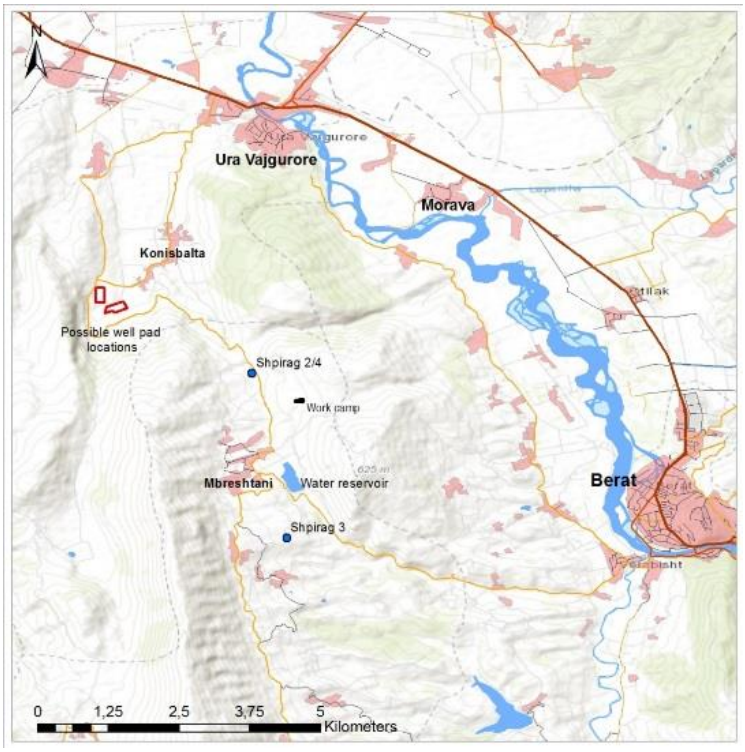

Figure 1 gives an overview of the area where the Shpirag-5 well pad is aimed to be located, showing the Preferred and Alternative well pad sites and surrounding area including nearby villages/ cities, water reservoir and the existing Shpirag-2/4 and Shpirag-3 well pads and the existing camp.

The Shpirag-5 appraisal well is to be located in an agricultural area, with no housing within the proposed well pad Preferred and Alternative sites.

Figure 1: Topographic map with the proposed alternative well pad sites and surrounding area water reservoir and the existing Shpirag-2/4 and Shpirag-3 well pads and camp.

Shpirag-5 is an appraisal well that serves to assess whether sufficient gas or oil can be found to ensure a profitable exploration. If sufficient oil or gas is not found, the location will be abandoned. The appraisal well will target the very deep subsurface layer called 'Shpiragu'; this is a layer expected to contain oil or gas. The aim of the project is to help determine if this reservoir contains producible hydrocarbons (light oils, condensate and natural gas).

1.3 Purpose of the ESHIA process

The ESHIA objectives are to:

- Provide information on the project background and its interaction with environment and social characteristics in the project area;
- Identify potential project impacts of the project design;
- Consult with project stakeholders and the Ministry of Tourism and Environment (MTE) and National Environment Agency (NEA) and obtain their views on the project;
- Comply with the EIA procedure in Albania and the IFC performance standards, in case of any missing regulations, follow the EU regulations;
- Inform stakeholders and general public about the study results, obtain their views, concerns and integrate into the study;
- Enable contribution from all stakeholders through a social survey and the public hearing process.

At this stage of project development, the **Draft ESHIA** has been compiled and submitted to the regulator (MTE). This marks the start of the **disclosure period and communication campaign** that will last 30 days and will be followed by Public Hearings in the project area. Requests, concerns or suggestions from these steps will be analysed and addressed in the **Final version of the ESHIA report**.

Description of the Methods for preparation of the ESHIA report

Table 1 outlines the steps in the development of the ESHIA Report.

Table 1: Steps of the ESHIA development

Steps	Remarks
1	Perform the site survey for scoping process
2	Conduct initial engagements with the relevant stakeholders
3	Submit the Scoping Report to the authorities on the 8th May 2018 (Ministry of Tourism and Environment)
4	Conduct the baseline site surveys for the ESHIA: i.e. noise, water quality, biodiversity, archaeology, social surveys
5	Execute the impact assessment considering the Albanian, Shell standard operational measures and IFC performance requirements and when appropriate the EU regulations
6	Develop mitigation measures where necessary
7	Conduct informative campaign and organize the Public Hearing
8	Submit the Final ESHIA to the authorities (Ministry of Tourism and Environment)
9	Review and approve report and issue of the Environmental Declaration by MTE and NEA

In drafting the Scoping and ESHIA report, the following methodologies for data collection and data sources were applied:

- Collection of available published data relevant for the scope of the ESHIA.
- Collection and review of relevant data from several ESHIA reports previously conducted for exploratory and appraisal drilling in the Shpirag area (this includes EIA permit documents and internal documents commissioned by Shell and not publicly available)[1].
- Extraction of data from Environmental Monitoring Reports of Shell on current drilling operations and application of this in the impact assessment in the ESHIA report.
- Conduct a set of specific site surveys and baseline studies in April 2018 to fill data gaps and obtain specific and site related data, such as biodiversity and habitats, archaeology and social and the socio-economic settings of the project area. A second mission was organised in June 2018 to assess the hydrological and hydrogeological situation in the project area.
- Conduct consultation with stakeholders as important source of information during the ESHIA process. Details of these meetings are provided in the Stakeholders Engagement Plan Appendix **Error! Reference source not found.** to ESHIA Report.

1.4 Consultations with stakeholders and groups of interest during ESHIA process

A Stakeholder Engagement Plan (SEP) has been developed as a basis for engagement with the affected communities throughout the ESHIA process for Shpirag-5. The objective of this SEP is to provide relevant stakeholders and affected communities with opportunities to express their views on project risks, impacts and mitigation measures, and allow Shell to consider and respond to them. Shell has appointed a qualified Community Liaison Officer (CLO) to conduct the community engagement in the project area and record

[1] *For the development of the ESHIA for Shpirag-5, Shell requested Royal HaskoningDHV and EMA to extract information from* these reports *and use it in the impact assessment. The extracted information has not been verified by the consultant.*

and manage any project related grievance. During the project execution, Shell will monitor project-related social impacts and will establish additional mitigation measures, if required.

In presence of the Consultants for the ESHIA, up to the moment of the submission of the draft ESHIA to the regulator the following engagements have been conducted:

- 10 meetings were held with officials on national, regional and community level during scoping mission. The aim of the meetings was to inform stakeholders about the project and collect their opinions and recommendations for ESHIA development and wider stakeholders' engagement;
- 22 meetings were held with households in Konisbalte, Mbreshtan and Pashalli during the baseline phase of the project. The aim of the meetings was to inform households on the project and collect their concerns;

Additionally, 12 meetings were held by the Shell CLO with a total of 47 individuals from Sinje administrative unit, stakeholders in Konisbalte and Pashalli including village heads, women, health professionals and teachers, and residents / landlords close to the proposed well site and project roads. The purpose of these meetings was to build up community understanding of the Shpirag-5 project. Any relevant information was fed to the Consultant of the ESHIA for consideration in the EHSIA process.

Overall, the authorities welcomed the project and the opportunity to bring international ESHIA experience and Best Practices into Albania. The following main concerns where recorded by the project team from the authorities and from the nearby villages:

- The impact of road dust and health & safety aspects related to traffic;
- The cumulated impact of noise from the quarries, trucks and the drilling equipment
- To ensure the management of waste generated by project;
- To include cumulative impacts in the ESHIA because the Shpirag-5 project will add to the existing impacts caused by the industrial activities in the region.

Details of these engagements are provided in the Stakeholders Engagement Plan Appendix **Error! Reference source not found.** to ESHIA Report. The concerns are taken into consideration by RHDHV/EMA in the proposal of mitigation measures to be taken during the project execution.

In accordance with the requirements of the Albanian legislation, the disclosure of the project information started with the preparation of the Scoping Report that was submitted to the regulator on the 8th of May 2018. This draft ESHIA is also submitted to the regulator. Next element of the process is the organisation of the Public Hearing in the communities that may be affected by the project. For this purpose, various communication materials will be developed and distributed at each community and village within near the Project area i.e., Konisbalte, Pashalli and Mbreshtan. The communication materials describe the appraisal drilling project and expected impacts (based on this ESHIA) to the community as well benefits that could be expected. The NTS will be distributed to the local authorities in Berat and Ura Vajgurore Municipality and Sinja Administrative Unit as well as in the two villages that may be affected by the project. The date and the venue of the Public Hearing will be advertised on local TV channel and newspaper. Communication materials will state the contacts details of the CLO who can be contacted to learn more about the project. The concerns collected during the Public Hearing will be recorded and processed into the Final ESHIA report.

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2 Project description

2.1 The Shpirag-5 project activities

The Shpirag-5 appraisal well activities include:

1. Site preparation and construction;
2. Well Drilling;
3. Short and Extended Well Appraisal and Vertical Seismic Profile (VSP);
4. If successful: Appraisal Pilot System phase (not part of this ESHIA process)
5. If successful: Commercial production phase (not part of this ESHIA process
6. If unsuccessful: Well abandonment, demobilization and reclamation

1: Site preparation and construction

Site preparation and construction includes: construction of the access road(s), site preparation (clearing of vegetation, levelling, compacting, and gravelling), digging and lining of storage pits, constructing the well cellar, rig mobilization, technology installation and transport of materials, water supply infrastructure (pipeline). The Preparation phase takes approximately 5 months.

Figure 2: View of the drilling rig on the Shpirag-4 well site

2: Well Drilling phase

The main activities of the well drilling phase include: drilling operations of the well, transport and storage of the materials, fuels and water, solid waste and wastewater management. Drilling requires a drilling rig with crew, use of drilling fluids (oil and water based), petroleum fuels, casing and cementing the well and a source of water. The well site will be operated 24 hours per day. However, some activities (i.e. deliveries of materials) will only occur during daylight hours. The drilling period is expected to be 1 year but may take up to 18 months; the project total duration will have a minimum of 2 years.

Figure 2: View of the drilling rig on the Shpirag-4 well site shows the drilling rig on the Shpirag-4 well site.

3: Short and Extended Well Appraisal and VSP

Short Term Well Appraisal

Following drilling and well completion, Short Term Well Appraisal will take place for approximately 10 days. During this phase, the well will be logged and measurements under flowing conditions will be taken to determine if the well is technically or commercially viable for possible future developments. Oil produced during this phase will be temporarily stored on-site, while associated natural gas will be pre-treated and flared.

Extended Well Appraisal

If the Short Term Well Appraisal is successful, an Extended Well Appraisal will be performed for a period of up to 90 days to evaluate longer term production performance of the well and provide input data for the design of the possible next phase called Appraisal Pilot System (APS) facilities, not part of this project scope. During the Extended Well Appraisal, crude oil will be transported from the well site by truck and associated gas will be pre-treated and flared. Hydrogen Sulphide (H_2S) will be scrubbed from the hydrocarbon stream to safe levels for trucking of oil and flaring of gas. If the well does produce oil at commercial rates, it will be temporarily suspended pending decisions around a temporary appraisal system (subject to further impact assessment and permitting).

Vertical Seismic Profile
Before or after the short and extended well appraisal a seismic survey will be conducted to obtain additional information of the structure and properties of the rock layers. The technique involves a source that generates sound energy from the surface to the subsurface. The recorders (geophones) are placed at various depths in the wellbore. These geophones will measure the time taken for a sound wave to travel from the surface to a known depth in the well.

4 & 5: Appraisal Pilot System phase and Commercial production phase (both not part of this ESHIA process).

6: Well Abandonment, Demobilization and Reclamation
If the appraisal well does not demonstrate commercial production rates of hydrocarbons, it will be sealed and measures put in place to prevent migration of fluids between formations or migration of any oil or gas towards the surface. Several cement plugs, each more than 100 metres in length at critical formations will be placed inside the well. Well abandonment requires approximately 30-40 days. Following completion of drilling operations, the drilling rig, the ancillary equipment and structures will be removed from the drilling area. After well abandonment, the well pad and ancillary facilities will be restored to their original state as much as possible (returned to agricultural land), according to a detailed Reclamation and Abandonment Plan that will be made and discussed with the Authorities and communities before abandonment. Demobilization takes approximately 30 days and Site reclamation about 5 months.

2.2 Location of the Project area

Two alternative **well pad locations for Shpirag-5** are studied in the ESHIA. These alternative locations are shown in *Figure* 3, the **Preferred location (left)** the **Alternative location (right)**. The required new and upgraded access roads are also shown. In this NTS only the Preferred location will be presented further. For details on the Alternative location reference is made to the full ESHIA report.

A water pipeline will be installed from the well pad to Mbreshtan water reservoir. The well pad requires an area of approximately 2 hectares. This includes water pits, cutting pits and storage area. The access roads and the surrounding affected area are fully assessed in this ESHIA.

The site of the Preferred location does not cross any streams or waterbodies. The new and upgraded access roads will have a width of 8 metres. For the **Preferred location** 125 metres of new access road is expected to be required and 77 metres of road is expected to be upgraded.

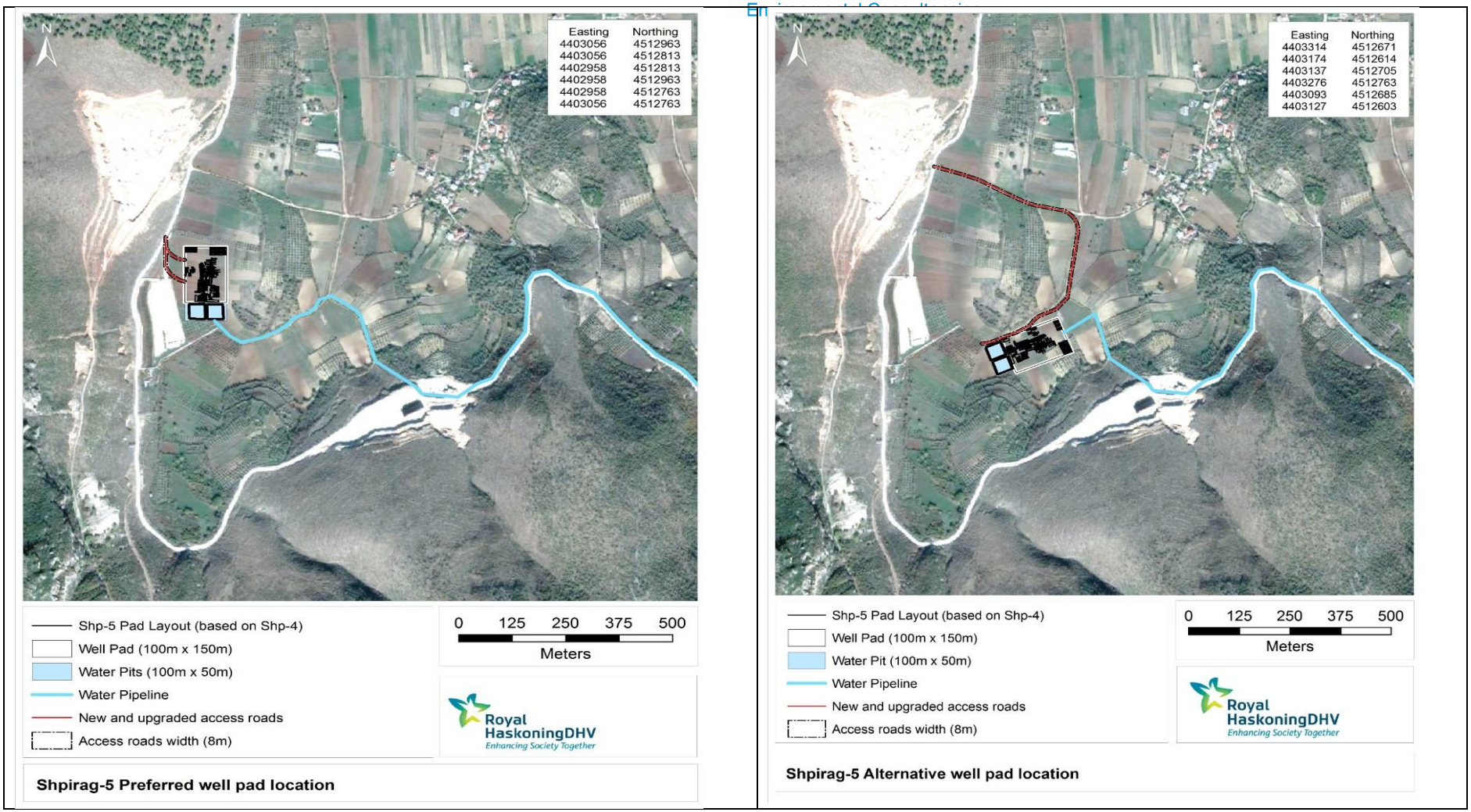

Figure 3: Preferred location for Shpirag-5 well pad (left) and Alternative location for Shpirag-5 well pad (right)., both including new and upgraded access roads (in red)

In terms of the project area, the Preferred well pad and associated infrastructure is located in an agricultural area near Konisbalte village. The edge of Konisbalte village (first house) is located 392 metres from the Preferred well pad location. The distances of the possible well pad locations to the nearest houses are shown in Figure 4 . Distances to houses are in accordance to the local Land Use Plan, which states that the distance of a well pad to houses should be at least 200 metres. For the Preferred location, access road and project traffic for the well pad will be at a distance of 445 metres from the nearest house.

Land use of the proposed well pad and surrounding area consists of agricultural land (cereals, vegetables and different forage crops for livestock). There are also some areas with olive trees and small wine vineyards. The final well pad footprint will avoid land take from vineyards and olive trees. Next to the Preferred location lays a storage area (not in use at this moment). On the slopes of the hills there are two stone quarries and a licensed explosives storage depot.

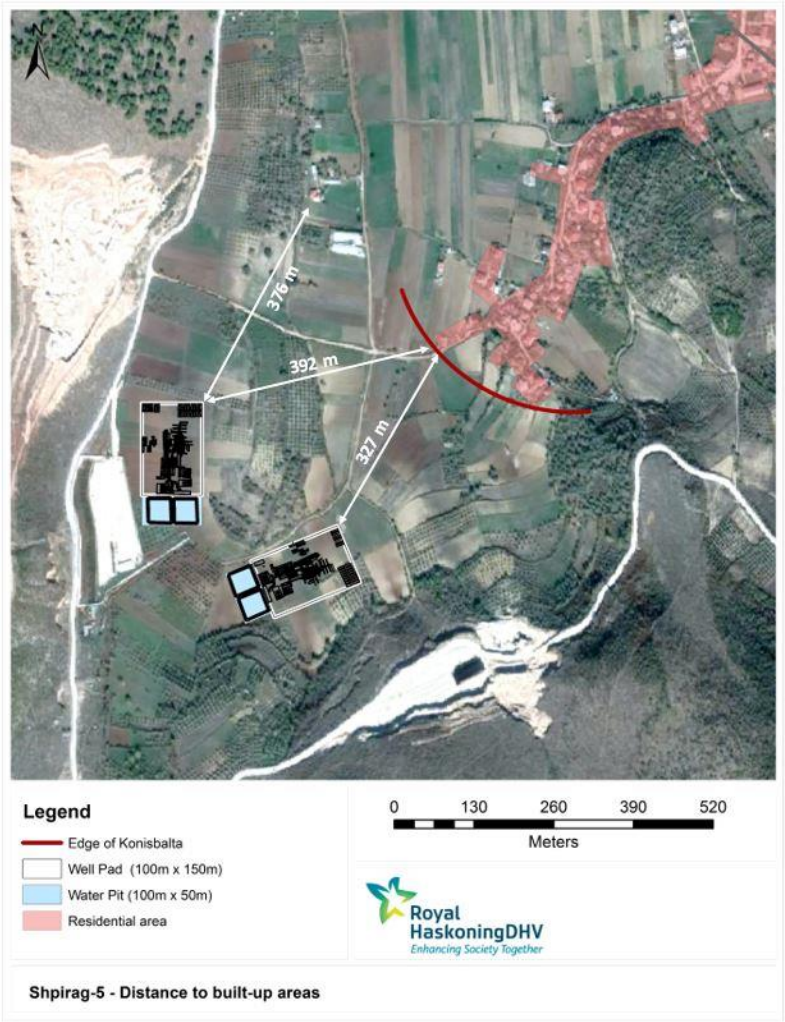

Figure 4: Minimal distances of the two possible well pad locations to the nearest houses.

3 Analysis of considered alternatives

In an ESHIA assessment for an appraisal well, the choice of the project location is the most important element in the assessment since most impacts are directly in the vicinity of the well path.

During the field visit leading to the Scoping report two possible locations were identified. The first one, near the main road, has (later in the process) become the **Preferred location** and the second one, further back from the road has been named the Alternative Location.

Furthermore, several technology options have been assessed regarding water supply: a water pipeline or a groundwater well. Water harvesting has also been assessed. In this ESHIA report the pipe connection to the Mbreshtan reservoir is used as reference.

4 Baseline environmental data

Project area and Area of influence

In order to properly assess the environmental, social and health impacts, a larger **Project area** is defined (2 km radius around the well pad). This is the area were **potential impacts** from the project are considered. The actual **Area of Influence** is assessed for each impact in this ESHIA and is typically a smaller area than the area of potential impact. The area of influence determines the study area for the different receptors.

The study area differs for different receptors:

- The potential impacts to soil are considered only on and in the direct vicinity of the potential well pads;
- The potential impacts to groundwater, surface water, biodiversity, air and health, have been considered within a radius of 1,000 metres from the two alternative well pad sites. Thus, the total study area for impacts to groundwater is circa 390 ha per project location.
- The potential impacts regarding social aspects and cultural heritage monuments are mainly considered within a radius of 2,000 metres from the two well pad sites. Thus, the total study area for social and cultural impacts is circa 1260 ha per project location. Note that certain social impacts, and especially positive impacts, could occur outside of this study area. For example, local jobs or purchase of local goods and services can be within a larger area.
- Potential impacts related to the access roads are considered up to 200 m from each side of the road. Impacts related from road traffic have been considered along the road from the well pad up to the point where the traffic is included in the prevailing traffic image. This is up to the point where the traffic reaches the main road SH72 at Ura Vajgurore. Thus, the total Project area regarding the access roads is approximately 250 ha.

The Project area of both potential well pad locations for Shpirag-5 are shown Figure 5.

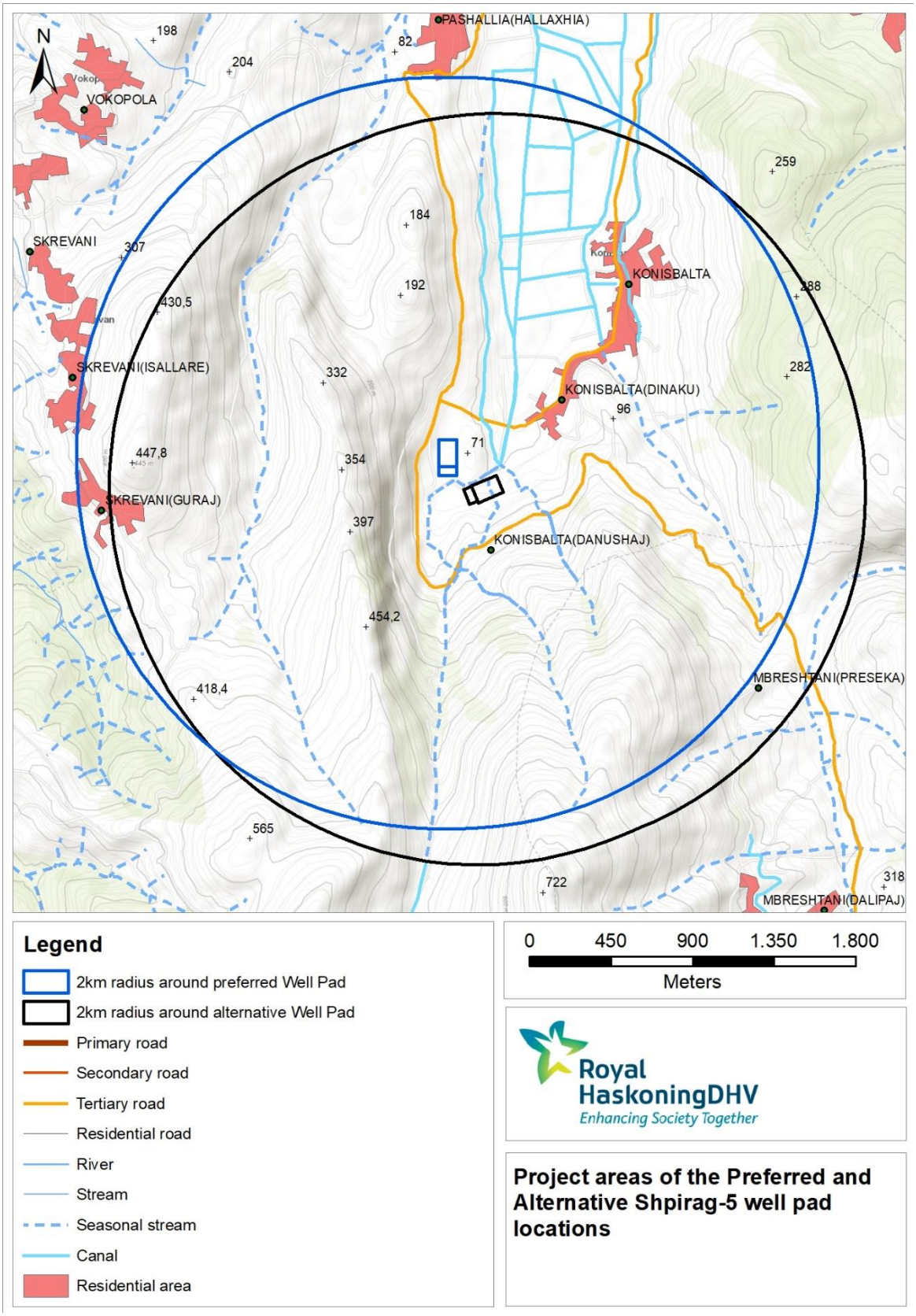

Figure 5: Topographic map of the Sphirag-5 potential well pad locations and their respective Project Areas (Large Blue and Black circles)

4.1 Physical environment

The Shpirag-5 proposed well pad area is located in Eastern part of Mediterranean Plains climatic subzone. There is significant precipitation during the autumn and winter, mainly in the form of rain. The physical setting of the proposed well sites and access roads is hilly- mountainous with the Shpirag Mountains located in the East (altitude of up to 300 m). The preferred well site is located in a valley which consist of Quaternary sediments (recent deposits of gravels, sands and clays) and river alluvions.
There are two types of soils in the proposed project area: calcic luvisols and leptic calcisols. These can be described as fertile soil, suitable for a wide range of agricultural uses. Currently the area is subject to anthropogenic land use. The sensitivity of the soil is lower than that of natural areas in terms of ecosystem functions, but it is similar in terms of provisioning, soil structure and soil quality.

Within the project area there is a perennial stream present which is also used for drainage of the agricultural land. The water flows for several months each year. There are no permanent water bodies within the project area. The ground aquifers have a moderate productivity. The available quantity of surface water and, to a lesser extent, the quantity of groundwater, decreases significantly during the summer.

4.2 Biodiversity and habitats

In particular on the hill sides, a wide range of habitats are found inside the Shpirag 5 project area ranging from Mediterranean pine forests and areas dominated by pre-desert shrubs to small scale agricultural areas. The preferred well site is located in “Small scale agricultural land area” habitat.

Some of the plant species have scientific value and are included in the group of species of national conservation concern, i.e. *Salvia officinalis, Hypericum perforatum, Juniperus oxycedrus, Origanum vulgare, Sambucus nigra, Satureja montana*. However, these plants can only be encountered on the hillside, relatively far away from the preferred well site. At the preferred well site, there are no **endangered and/or threatened plant species** recorded.

The mammalian fauna has low populations and relatively poor species diversity, because most of the area around the well path locations is dominated by artificial and modified rural agricultural habitats and heavily degraded scrubs ecosystems. These fauna species use the preferred drilling pad location for foraging, and in some cases to live there (reptiles, amphibian species or vertebrates). None of mammals occurring in wider surroundings of the project area (mostly on the hills) are globally threatened and all species which are expected to be present in the project area (mostly on the hills) are considered to be at risk.

In total, 19 species are nationally threatened, including 4 mammals, 12 birds, 2 reptiles and 1 amphibian species. None of the endangered and threatened fauna species at national level live on the proposed well sites, but some of them use the site as part of their foraging ground, such as birds of prey (*Buteo buteo, Falco tinnunculus, Accipiter nisus*), polecat (*Mustela putorius*) and badger (*Meles meles*).

No protected areas and nature monuments are situated inside or in the surroundings of the Shpirag -5 Project area. The directly impacted area is located on private land. There are no forests and pastures in the vicinity that are owned by the municipality.

However, since some of the above-mentioned species are using the well sites for foraging and living, possible impacts may occur in particular related to the preparation of the drilling locations.

4.3 Environmental quality and existing impacts

The preferred drilling location area is considered a rural area with dominance of agriculture activities, in its vicinity several industrial developments are ongoing.

The main existing activities in the region with environmental implications surrounding the project area include: agriculture and farming, stone quarries and the ongoing exploratory drilling of Shell. The Trans Adriatic Pipeline construction operations have ended. Other activities relate to the human settlements, such as solid waste and wastewater generation. Soil erosion is evident along the hilly areas due to overgrazing or weak soil structure.

Soil quality in the agricultural areas is relatively poor, having moderate to severe limitations that restrict the choice of crops and/or require special conservation practices (e.g. crop rotation, method of tillage and timing of tillage). Analytical results of the soil samples taken in the project area during the field surveys in 2015[2], show relatively elevated values for Nickel which exceeds the Dutch Intervention Values of 100 mg/kg. This data was further investigated, and it was concluded that Nickel values represent the natural background concentrations in the area.

The groundwater from the village well at Konisbalte (a one-off sampling on the 20th of June 2018 by Royal HaskoningDHV and EMA Consultants), show the water quality. Only Phosfor-total and Ammonia are slightly above the recommended values when comparing to the national thresholds (for details, please refer to ESHIA Report, Appendix 4 Water Resources Study). In particular, the value of Ammonia makes the water unfit as potable water. The one-off sampling of the stream on the 20 June 2018 (by Royal HaskoningDHV and EMA Consultants) near proposed well pads has a similar composition (for details, please refer to ESHIA Report Appendix 4 Water Resources Study). Only P-total, Ammonia and Barite are slightly above the recommended values. This means that also the water from the stream is not suitable as drinking water.

The main sources of air pollution near the project area are the limestone quarries and aggregated mining activities, located near the villages of Konisbalte and Pashallia. These activities generate considerable dust and noise. Other sources of air pollution include vehicle traffic, gravel roads, waste burning and agriculture activities that involve use of tractors and other machinery.

In the course of a previous internal study for the drilling commissioned by Shell, a specific air quality field survey was carried out along a period of 3 months to determine the air quality in the project area. The results of these measurements indicated that the air quality is well below Albanian national thresholds for such elements as NO_2, SO_2, Benzene and Toluene.

Noise levels measurements conducted in 2015 as part of the same study as for air and soil sampling indicated similar levels as the Albanian noise standards for daytime. These levels have been confirmed in a more recent study conducted in 2018 by Royal HaskoningDHV and EMA Consultants. The average value for daytime (16 hours) outside residential buildings is 55 dB(A). This corresponds to the Albanian standard of (a maximum of) 55 dB(A). The Albanian night-time noise standard is 45 dB(A).
Based on the field survey current light nuisance was limited and mainly related to vehicles driving at night along the connecting road Pashalli – Mbreshtan.

Other existing environmental impacts in the project area relate to: erosion along the hills; fires along the hills; habitat fragmentation and disturbance; waste burning (including weeds and grasses) in the open air by households.

[2] *Internal study commissioned by Shell (not published); Shell asked Royal HaskoningDHV and EMA (the consultant) to extract the information and use it in the impact assessment. The extracted information has not been verified by the consultant.*

4.4 Socio-economic environment and health baseline

Konisbalte, where is the preferred drilling location, and nearby Pashalli village are part of the Ura Vajgurore Administrative Unit (together with the city of Ura Vajgurore, and villages of Bistrovicë, Vokopolë and Skrevan). Ura Vajgurore Administrative Unit is one of the four administrative units of Ura Vajgurore municipality together with Poshnje, Kutallia and Cukalat registered under the Berat County.

According to the Census of 2011, the Ura Vajgurore municipality has 27,295 inhabitants and with an area of 156 km², it has a density of 174 inhabitants/km². According to the Civil Registry office there are 805 inhabitants in the village of Konisbalte. The Konisbalte village is 70% Orthodox and 30% Muslim. An Aromanian minority is present in the Konisbaltë village. There are no religious buildings in Konisbalte and there are no religious tensions in the project area.

Access to primary education in the project area is good as most villages have an elementary school of 1-4 year. The villages of Mbreshtan, Konisbalte and Pashalli have health care centres that provide basic medical attention. Advanced care and pharmacies are available in the city of Berat and Ura Vajgurore, at 7 km and 4 km away, respectively.

The area in the Shpirag-5 is known for surface stone mines, and recently, for the processing of granite and lime stone. The area is also known as the 'quarry' of Albania because of the large number of private companies that carry out activities in this industry, especially in Konisbalte and Pashalli. The quarrying activities give local employment, but also result in significant dust emissions, heavy traffic movements, noise emissions and have a visible impact to the landscape.

In Konisbalte, people are raising livestock (sheep, goats, and cows) partially for household consumption, and the rest for sale. At the edge of the village, near the proposed well pads, there are also two beekeepers, which use the land, including the proposed well pads, to produce honey. In Pashalli village there are a few families that do livestock farming with fairly large flocks of sheep. An interview with the Village Head has shown that trucks are a danger to flocks of sheep being shepherded. Agricultural production in the villages near Shpriag-2/4 has improved in recent years with the introduction of more fruit trees. However small lot sizes mean that mechanization and access to credit is costly. The investment in better technologies are therefore limited, reducing efficiencies and profits. Improvement of the irrigation system is a major concern cited by residents interested in improving agricultural production. In the project area, farmers cultivate mainly olive and fruit trees, while there are fields of corn and wheat for household consumption. The villagers are also cultivating cabbage, leek, vineyard, oat, alfalfa, fodder, almond, cherries, tomato and peppers.[3]

No visible archaeological traces were identified near the proposed well pads or new/ upgraded access roads for Shpirag-5, during the Archaeological and Cultural Heritage Survey, performed in April 2018 by Royal HaskoningDHV and EMA Consultants.

5 Analysis of the potential negative impacts to the environment

5.1 Impact assessment methodology

The Impact assessment predicts the magnitude and quality of impacts that a proposed project activity will have on an environmental receptor in space and time and its mitigation potential. The following methodology for the environmental impact assessment was followed:

1. Identify all proposed project actions, which are likely to have an impact.

[3] *Interviews will villagers from Mbreshtan, Konesbaltë and Pashalli villages April 10-12, 2018.*

2. Identify sensitive areas and receptors based on baseline findings.
3. Identify potential impacts associated with each project activity.
4. Identify the standard measures that are in place to prevent or mitigate impacts.
5. Apply the scoring system to rank the impacts.
6. Determine the type of the impact, namely direct or indirect to the affected receptors.
7. Fill out the impacts scoring matrix considering the standard measures that will be put in place and the concerns and input collected during the stakeholder engagement process.
8. If impacts are considered significant, propose additional mitigation measures.

SUA will implement its standards measures to the Shpirag-5 project in order to prevent or reduce impacts to the environment and to social and health receptors. Because these measures are standard for such projects, they are included to the attributed scores of the Impact Assessment. Only if impacts are considered significant, additional Mitigation measures are identified (see Additional mitigation measures 8.1 in the current NTS). The list of standard measures included in ESHIA Report is a long list of all measures that Shell/ SUA employs to prevent or reduce environmental, social and health impacts. These are controlled by Shell's Management System Framework, where all detailed measures are listed. We refer to the ESHIA Report for details on SUA standard mitigation measures (see chapter 5.2.4 SUA standard measures in the ESHIA report). All identified negative impacts were scored on five criteria: *Probability of Occurrence, Area of Influence, Duration, Magnitude and Mitigation Potential*. The total impact was determined based on a weighted average of these five criteria, see Table 2. **All standard measures that are normally applied by Shell/ SUA or its contractors have been considered when attributing the scores**.

Table 2: Definition of the scaling system used to evaluate each impact of the Impact Assessment.

Criteria and the Scale used for the Impact Evaluation					
Probability of Occurrence					
Remote (0)	Very Low (1)	Low (2)	Medium (3)	High (4)	Certain (5)
Area of Influence (Extent in space)					
No Impact (0)	Within project area footprint (1)	Within or the vicinity of the project area (2-3)	Within, vicinity or/and extended area (4-5)		
Duration					
Hours to Days (0)	Days to Weeks (1)	Weeks to Months (2)	Months to Years (3)	Years to Decades (4)	Permanent (5)
Magnitude					
None (0)	Very Low (1)	Low (2)	Medium (3)	High (4)	Very High (5)
Mitigation Potential					
Total Mitigation (0-1)	Total Mitigation with Difficulty (2)	Partial Mitigation (3)	Partial Mitigation with Difficulty (4)	Mitigation Not Possible (5)	
Total Qualification of Impact					
None (0)	Very Low (1)	Low (2)	Medium (3)	High (4)	Very High (5)

This methodology results in a weighted average score for each potential impact ranging from 0 (no impact) to 5 (very high impact). All impacts that have a **total score above 3** (medium impact) are **considered significant**. For these impacts additional **mitigation measures** have been proposed (see Additional mitigation measures 8.1 in the current NTS).

5.2 Impact Assessment matrix for the Preferred location

The tables below list and ranks each potential impact using the scoring system described above. Table 3 presents the impacts and the total score for the Preferred location. The table list possible receptors that

can be impacted by the project activities and the potential identified impacts that can be generated by the project activities for each receptor. Each impact is scored, and an average weighted value is calculated in the last column of the table (for details per identified potential impact, reference is made to the full ESHIA).

Table 3: Impacts assessment matrix for the Preferred location.

Receptor	Identified potential impact	Direct/ indirect	Weighted average
Soil	Potential disturbance and degradation (soil erosion – soil compaction – soil removal) due to well pad construction and site operation	D	3.0
	Potential contamination of soil during well pad construction and site operation (i.e. spills, leakage, use of chemicals & oils)	D	2.6
	Loss of soil function due to well pad construction and site operation	I	4.1
Groundwater	Possible groundwater contamination due to accidental spills and contaminants reach aquifers	I	2.1
	Possible groundwater contamination due to drilling fluids and well leakage and contaminants reach aquifers	I	3.0
Surface water	Sediment plumes & runoff	I	1.9
	Potential contamination by accidental spills, runoff, floods or leaks	I	2.8
	Potential contamination due to drilling fluids and well leakage and contaminants eventually reach surface waters	I	2.8
	Surface water use (Mbreshtan reservoir)	D	2.3
Biodiversity	Loss and fragmentation of habitat due to land clearance for well pad and access roads	D	2.5
	Loss of native flora and introduction of invasive species due to well pad construction and site operation	D	1.8
	Habitats degradation from air emissions like sulphur oxides and nitrogen oxides, dust and other pollutants like soil & water due to well pad construction and site operation	I	2.1
	Disturbance to wildlife from noise and light due to well pad construction and site operation on and in the vicinities of the well pad (not on the hills)	D	3.1
	Increased mortality of wildlife due to well pad construction and site operation.	D	2.5
Air quality	Pollution of local air quality due to non-dust air emissions from project related traffic and site operations like sulphur oxides and nitrogen oxides	D	3.5
	Emissions of dust caused by traffic and site operations.	D	4.0
	Odour	D	3.2
Waste	Potential adverse impacts to soil, groundwater and surface water due to permanent burial of cutting pit on site	D	2.6
	Reduction of the multifunctionality of the land plot due to long-term burial of cuttings and well head	I	3.5
	Waste may not be properly and responsibly disposed of if handled by untrusted companies	I	2.9

Receptor	Identified potential impact	Direct/ indirect	Weighted average
Social	Reduction of agricultural land for local community due to project development	D	2.9
	Damage to crops during construction and reclamation of the site	D	2.5
	Impacts to communities from dust, air emissions, noise and light generated by project related activities	D	3.5
	Potential pollution of soil, groundwater or surface water in use by residents caused by project related activities	I	2.7
	Visual impact of the project to the landscape	D	3.2
	Possible damage to local property, community infrastructure and accidents with cattle on access road.	D	1.7
	Possible conflicts with residents such as about land ownership, compensation, jobs, water reserves, pollution and impacts such as noise, dust, light and the landscape aesthetics.	I	2.4
Health and safety	Traffic or work accident	D	2.9
	Risk of H_2S release, blowout or fire/explosion at the well pad	D	2.3
Archaeology	Loss of artefacts.	I	1.3

The impact of a **H_2S release** or related incidents at the well pad is ranked at **2.3**. Although the effects can be severe, the probability of occurrence is extremely low. Special attention will be given to mitigate noise and dust emissions, due to the high background level for noise and existing nuisance from dust. The **visual impact** from the Preferred location to the residents of Konisbalte is ranked as **medium (3.2)**, because part of the well pad is removed from view, due to the presence of a small hill. For further explanation of the assessment refer is made to the full ESHIA report.

6 Potential transboundary impacts

No transboundary impacts have been identified during the ESHIA process.

7 Potential positive impacts of the project

Potential positive impacts of the project are:

- Employment opportunities for local community (although limited). Current number (64) of local employment on another rig site will be maintained for Shpirag-5;
- Providing training and skills for local employees;
- Payment of local and national taxes;
- Additional revenue from land acquisition/lease to the land owner;
- Spin-off effect from the appraisal project on the local/regional level, i.e. use of cafes/restaurants/hotels by the project staff and project subcontractors (e.g. purchase of construction materials such as aggregate from the quarries);
- Developing the national oil and gas sector and increasing domestic energy production;
- Implementation of social investment plans: SUA will continue to invest in projects that support education, employability, health, road safety and community development;

- Road watering for the project also reduces dust emissions from other traffic on the gravel roads. If it is feasible to use an effective road watering additive, these dust emissions are reduced even further.

8 Mitigation measures to protect the environment based on the identified negative impacts

8.1 Additional mitigation measures

Impacts related to **Air quality, noise and dust**, **visual impacts, soil, biodiversity** and **waste** are rated above 3.0. These impacts are **considered significant** and further mitigation measures are required and proposed in the ESHIA Report. RHDHV advises Shell/ SUA to implement these or similar mitigation measures to reduce the impacts that are considered significant.

Table 4 provides an overview of the additional mitigation measures proposed as the result of the project impact assessment.

Table 4: Mitigation measures summary table .

	Impact	Mitigation measure
1	Degradation, disturbance and loss of soil functions	If after the application of the standard SUA measures to bring the soil quality to the pre-project state is not achieved, a suitable compensation will be provided following the requirements of the IFC performance standard number 5 on Land Acquisition and Involuntary Resettlement. We recommend that an independent private licensed land evaluator (paid by Shell) will assist the landowner/tenant in the judgement of this offer.
2	Dust emissions	Investigation of non-hazardous additive to suppress dust emissions from gravel roads.
3	Air emissions	When the type of generator is known that will be used for drilling in Shpirag 5, its emissions will be assessed at that time in order to become compliant with the applicable standards. If this assessment shows that the emissions exceeds the standards, Selective Catalytic Reduction (SCR) equipment at the generators or other measures to reduce air emissions should be considered.
4	Air emissions (odour)	Odour from mercaptans was a problem during the Shpirag-4 well appraisal and Shell has made design changes to the testing facility to avoid a repeat of the problem at Shpirag-5. These are: The design of the well test facility will aim to eliminate venting of mercaptans to air wherever possible, either by routing these vapours to the flare system or by the use of scrubber systems on the vents. If routed to flare, the mercaptans are combusted to form SO2 which is significantly lower odour and disperses much better due to buoyancy from heat from combustion. This will be the preferred approach as it reduces creation of further waste products from scrubbing.
5	Noise emissions	In General, noise emissions are monitored as presented in a monitoring plan, and additional measures undertaken if required. Specifically, the possible noise of the flare needs attention. Currently, it is not known which type of flare will be used. Once the flare equipment is known, a reassessment of the noise level impact is required and if it is expected to above the thresholds, silencer or other techniques need to be applied.
6	Reduced multifunctionality of land due to permanent burial of cuttings pit and well head	Compensation to land owners for reduced multifunctionality of the land plot shall be provided in line with IFC PS 5 on Land Acquisition and Involuntary Resettlement. We recommend that an independent private and licensed land evaluator supports the landowner in the negotiations with Shell. Feasibility study to find alternatives for on-site permanent burial of water-based cuttings.
7	Health and Safety risks related to storage and transport of waste that cannot be treated at this moment in Albania	In the short term, waste streams that cannot be treated safely in Albania (Calcium bromide brine and liquid waste stream from removal of H_2S from oil, gas), export arrangements will be made in line with the provisions of the Basel Convention. An export permit is required. Before exporting these waste streams, ensure that the waste is temporarily stored in a secured storage depot. For the long term, investigate possibilities for treatment of these waste streams in Albania.
8	Health and safety risk related to a H_2S release	The well appraisal system design should ensure that the SO_2 levels at grade that result from burning the H_2S in the flared gas are kept below harmful levels. The choice of flare, the use of real-time dispersion modelling to predict SO_2 concentrations and, if required, the use of scavenging systems to reduce the H_2S in the gas stream should ensure that the SO_2 in the flared gas disperses sufficiently to avoid forming harmful concentrations.

89	Visual impact of well pad	Explore if planting of a tree line at the edge of the settlement can serve as a visual barrier between the well pad and Konisbalte village.
10	Disturbance of wildlife on and in the vicinities of the well pad	It is advised not to start the site preparation during the breeding season (April-July). If site preparation starts during breeding season, clean the well pad location and the access roads 2 to 3 months before the breeding season starts and keep the site clean: remove bushes and moan the grasses regularly to avoid that wildlife make nests or seeks protection on the site. Check during the site preparation regularly for wildlife that start making nests and remove these before the nests are being used (this is valid for nests from all fauna including birds, snakes, tortoise, etc.).

Note that only the additional mitigation measures are considered in this table. SUA also implements the Standard measures as described in paragraph ***Error! Reference source not found.*** *of the ESHIA report as part of normal project implementation.*

9 Environmental monitoring of the project implementation

Environmental monitoring will be put in place to review and continually improve the effectiveness of mitigation measures during the implementation phase. It will consist of:

- Monitoring and measurement to improve understanding of the environmental quality (quality of soil, ground and surface water, air quality, noise level, etc);
- Sampling and testing of regulated emissions into the environment (end of pipe emissions/ discharges: i.e. waste flows generated by drilling and testing);
- Sampling and testing of relevant environmental quality parameters (related with project emissions).

For details on these measures reference is made to Chapter 9 of the ESHIA report.

10 Environmental Management and Monitoring Plan

The Environmental Management and Monitoring Plan (EMMP) is a delivery mechanism for environmental and social mitigation and enhancement measures as recommended in the ESHIA Report. The purpose of the EMMP is to help that these recommendations are translated into practical management actions which can be adequately resourced and integrated into the Project phases. The EMMP is, therefore, a management tool used to ensure that undue or reasonably avoidable adverse impacts of construction and operation are prevented or reduced and that the positive benefits of the Project are enhanced.

The plan sets the requirements for:

- Development of a code of conduct for all project-related employees, contractors and subcontractors to ensure compliance with the provisions of the EMMP;
- Development of a project organogram with details on the roles and responsibilities in the implementation of the EMMP and project mitigation measures;
- Organisation of the capacity building and training requirements for project contactors and sub-contractors;
- Impact Prevention and Mitigation programme;
- Development of specific management plans, among others:
    - Stakeholders Engagement Plan,
    - Emergency Response Plan
    - Reclamation and Abandonment Plan.

For details reference is made to the full ESHIA.

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