



RSM Geothermal Resource Validation

Beneficiary Manual 3.1



AFRY
ÅF PÖYRY

BENEFICIARY MANUAL 3.1



Prepared for:
Türkiye Kalkınma ve Yatırım Bankası (TKYB) and World Bank (WB)

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List of Acronyms

AoI:	Area of Influence.
As:	Arsenic
Ar:	Argon
ARAP:	Abbreviated Resettlement Action Plan
AWC:	Acceptable Well Cost
B:	Boron
BA:	Beneficiary Agreement
BM:	Beneficiary Manual
BP:	Business Plan
Ca:	Calcium
CAPEX:	Capital expenditure
CH ₄ :	Methane
CHMP:	Cultural Heritage Management Plan
Cl:	Chlorine
CO ₂ :	Carbon dioxide
CTF:	Clean Technology Fund
EA:	Environmental Assessment
EIA:	Environmental Impact Assessment
EMP:	Environmental Management Plan
EMRA:	Energy Market Regulatory Authority
ESIA:	Environmental and Social Impact Assessment
ESMP:	Environmental and Social Management Plan
ESMF:	Environmental and Social Management Framework
F:	Fluorine
Fe:	Iron
FI:	Financial Intermediary
FIT:	Feed in Tariff
g:	Gram
GHG:	Greenhouse gas
GIS:	Geographic Information System
GRM:	Grievance redress mechanism
H ₂ S:	Hydrogen sulfide
HT:	High temperature
IBRD:	International Bank for Reconstruction and Development
IRR:	Internal rate of return
K:	Potassium
kWh:	kilo Watt hours
Li:	Lithium
Mg:	Magnesium
M&E:	Monitoring and Evaluation
MEUCC:	Ministry of Environment, Urbanization and Climate Change
MIGEM:	General Directorate of Mining Affairs
MSDS:	Material Safety Data Sheets
MW:	Mega Watt
MW _e :	Mega Watt electric
MW _{th} :	Mega Watt thermal
MWh:	Mega Watt hours
Na:	Sodium
N ₂ :	Nitrogen
NH ₃ :	Ammonia
NPV:	Net present value
NCG:	Non-condensable gas
NGO:	Non-governmental organization
NZ:	New Zealand
O ₂ :	Oxygen
OHSMP:	Occupational Health and Safety Management Plan
OP:	Operation Policy
OPEX:	Operational expenditure

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P:	Pressure
PAP:	Project-affected people
PDEU:	Provincial Directorates of Environment and Urbanization
PIF:	Project Information File
PIU:	Project Implementation Unit
PO:	Power Output
RAP:	Resettlement Action Plan
RPF:	Resettlement Policy Framework
RSM:	Risk Sharing Mechanism
RSM Unit:	Risk Sharing Mechanism, implementing Unit
RSM Consultant:	Consultant to the implementing unit
s:	second
SC:	Success Criteria
SEP:	Stakeholder Engagement Plan
Si:	Silicon
SO4:	Sulphate
T:	Temperature
TFT:	Tracer Flow Testing
TKYB:	Development and Investment Bank of Türkiye
TMP:	Traffic Management Plan
TO:	Thermal Output
USD:	US Dollars
VAT:	Value added tax
WCG:	Well Cost Guideline
WB:	World Bank
WBWS:	Willing Buyer / Willing Seller

1 Introduction

The Risk Sharing Mechanism for Resource Validation (RSM) is one of the components of the World Bank-financed Türkiye Geothermal Development Project. The objective of the RSM is to **increase private sector investment in geothermal exploration drilling in Türkiye by providing partial coverage of drilling costs in case of unsuccessful exploration wells**. The RSM has been capitalized with a contingent grant from the Clean Technology Fund (CTF) to the Government of Türkiye. It is expected that a total of USD 37 million will be available for exploration drilling projects supported by the RSM. The implementing agency is a dedicated unit (RSM Unit) within the Development Investment Bank of Türkiye (TKYB).

This Beneficiary Manual (BM) contains all the relevant information needed by Applicants to apply for coverage by the RSM. The document starts off with an introductory overview of the prerequisites to be met by Applicants, followed by the application procedure, evaluation, and success criteria, well design specifications, well testing procedures, and monitoring and reporting requirements.

1.1 Background

The energy policy of the Turkish government has the following priorities.

- Maximizing exploitation of domestic primary energy resources.
- Securing sufficient, reliable, and affordable energy to a growing economy in an environmentally sustainable manner.

In this context, the government of Türkiye has put in place a supportive legal framework to facilitate geothermal development. A critical milestone was the Geothermal Law of 2007. This set out the rules and principles for effective exploration, development, production, and protection of geothermal and natural mineral water resources. In 2010 an amendment to the Renewable Energy Law established a feed-in tariff of 105 USD/MWh for geothermal power, for a 10-year period from the commissioning date, with an additional 27 USD/MWh to reward the use of locally produced equipment.¹

Geothermal resources in Türkiye are used for power production, as well as for space heating and tourism related applications. The installed capacity of geothermal power plants in Türkiye has grown rapidly in recent years. From some 15 MW_e in 2006 to 1,688 MW_e produced by 63 power plants as of April 2023. Moreover, according to the information published by Energy Market Regulatory Authority as of 10th of April, 2023; total installed capacity of geothermal power plants is 1861 MW_e and 1691 MW_e of this total installed capacity is in operation. Power plants with a total installed capacity of 170 MW_e are currently under construction.² This rapid growth has led the government to increase the target of developing geothermal electric generation capacity by 2023 from 1000 MW_e to 2000 MW_e. However, this growth has been restricted to Western Türkiye; most of the capacity development has taken place in the Menderes and Gediz valleys. The geothermal heat potential for Turkey is estimated as 35500 MW_{th}, whereas the geothermal power installed capacity is estimated at 4500 MW_e.³

¹ These FITs are valid until 30/06/2021. The FITs have recently been changed to 2020 TL/MWh at the base with an additional 280 TL/MWh for local equipment, with as lowest value 94.50 \$/MWh and highest value 115.50 \$/MWh. This is valid for projects realised before 31/12/2030, with a duration of 15 years. The link to this decision is: <https://www.resmigazete.gov.tr/eskiler/2023/05/20230501-7.pdf>

² See <http://lisans.epdk.gov.tr/epvys-web/faces/pages/lisans/elektrikUretim/elektrikUretimOzetSorgula.xhtml> (accessed on 10/04/2023)

³ Source: <https://enerji.gov.tr/eigm-yenilenebilir-enerji-kaynaklar-jeotermal#:~:text=T%C3%BCrkiye'nin%20muhtemel%20jeotermal%20%C4%B1s%C4%B1,4500%20MW%20olarak%20tahmin%20edilmektedir> (accessed on 10/04/2023)

Direct use application of geothermal energy is more widely spread in Türkiye than power production. While most of the direct use applications also occur in the Western part of the country, significant direct use applications are also found in the South-Eastern part and to some degree in the central part of the country as well. The total installed capacity of direct use of geothermal energy amounts to 5,113 MW_{th} as of August 2022, which has various applications. Those are given in the following table⁴

Table 1 – The total installed capacity of direct use of geothermal energy as of August 2022

House (district) heating in cities	: 1,422 MW _{th}
Greenhouse heating	: 1,230 MW _{th} (428.3 hectares)
Thermal Hotels & time sharing	: 680 MW _{th}
SPAs	: 1,763 MW _{th}
Fruit, Vegetable Drying	: 9.5 MW _{th}
District cooling	: 0.35 MW _{th}
Ground Source Heat Pump	: 8.5 MW _{th}
Total Installed power	: 5,113 MW_{th}

The RSM is a program designed to share the risk of exploration drilling of private investors acting as geothermal project developers (the Beneficiaries). After an exploration well is drilled, the RSM will compensate the Beneficiary in case of an unsuccessful well as agreed upon during negotiations between the RSM Unit and the Beneficiary with the mediation of the RSM Consultant. Conversely, the Beneficiary will pay a success fee to the RSM when an exploration well is drilled and is a successful well as defined in the Beneficiary's BP. The purpose of the evaluation process, as set out in this BM, is to ensure that the public funds capitalizing the RSM are used responsibly and are allocated in a transparent way. The applications will be evaluated by using the criteria as set out in this BM to ensure that potential Beneficiaries have carried out the appropriate surface exploration studies. Moreover, they should also have the necessary technical and financial capacity to complete the exploration drilling that they plan to undertake according to their geothermal energy-based BP.

1.2 Objective of the RSM

The RSM aims to promote private sector development of renewable geothermal energy projects in the early stages of geothermal exploration drilling by sharing the risk of the geothermal developer (i.e., the Beneficiary) failing to validate a geothermal resource capable of serving the Beneficiary's geothermal-based BP.

1.3 Basic Terms and Conditions of the RSM

The RSM will cover a pre-defined percentage of actual Acceptable Well Cost (AWC) (i.e., eligible drilling expenditures and related exploration studies when applicable) incurred by the license holder in the case of an unsuccessful well as defined by the agreed upon conditions in the BA. The percentage of actual Acceptable Well Costs that will be reimbursed to the Beneficiary for an unsuccessful well depends on the location. It will be 40 percent for projects located within the administrative boundaries of some districts

⁴ Source: <https://www.jeotermaldernegi.org.tr/sayfalar-Turkiye-de-Jeotermal> (accessed on 10/04/2023)

in Aydın, Denizli and Manisa⁵ where geothermal development is already at an advanced stage. In locations that are subject to 40% reimbursement, exploration study costs shall not be included as part of the AWC. For projects located elsewhere in the country AWC may include the actual exploration study costs as approved by the RSM Consultant with RSM Unit and will be reimbursed at 60% of the actual AWC for an unsuccessful well. When exploration study costs are included as part of the AWC, such costs will not exceed the maximum study cost of USD 300,000 for power generation drilling programs and USD 200,000 for direct use drilling programs.

In the case of a three well drilling program performed in a 60% reimbursement location, the actual study costs shall be apportioned by 1/3 into each of the three well AWCs and shall be paid out upon testing of each subsequent unsuccessful well. In the event of the first two wells being unsuccessful in a three well program, the program will be terminated. Upon such termination the exploration study costs apportioned to the third well will be added to the AWC of the second well and paid out accordingly upon the failure of the second well.

In the case of a two well drilling program performed in a 60% reimbursement location, the actual study costs shall be apportioned by 1/2 into each of the two well AWCs and shall be paid out accordingly for each unsuccessful well.

Reimbursement of actual AWCs for unsuccessful wells in any given drilling program will be capped at USD 4 million.

The Beneficiary will pay a 5% "Success Fee" of the AWCs only when the well is successful. To avoid the risk of delays in recovering the success fees after drilling is completed, the Beneficiary will be required to provide a success fee guarantee upon execution of the Beneficiary Agreement equal to 5% of the estimated AWC for all wells under the RSM program. The success fee guarantee can be paid in cash, by providing a letter of credit or by establishing an escrow account that can be drawn in case of non-payment (see Figure 1).

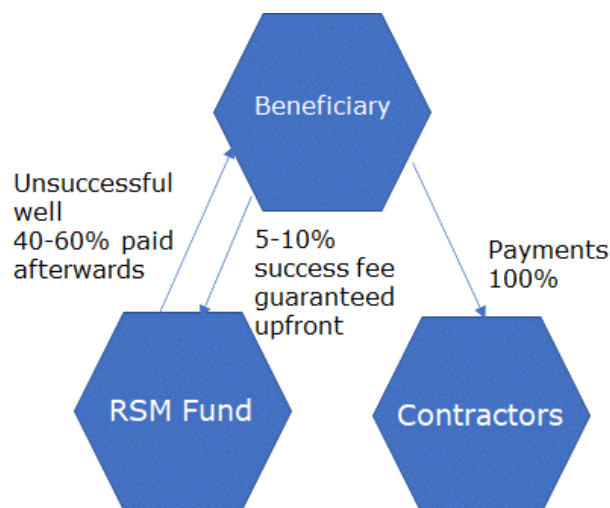


Figure 1 – Risk sharing parameters

⁵ All three provinces, Manisa, Aydın and Denizli have only been partially covered with geothermal explorations. Therefore, projects in regions outside the already explored geothermal basins, will be considered to be covered by 60% for the first three wells in the drilling programme, as elsewhere in Turkey. The five districts that qualify for 40% coverage in Manisa are Ahmetli, Gölmarmara, Salihli, Alaşehir, Sarıgöl. The twelve districts that qualify for 40% coverage in Aydın are Söke, Germencik, İncirliova, Koçarlı, Karpuzlu, Aydın Merkez, Köşk, Yenipazar, Sultanhisar, Nazilli, Buharkent, Kuyucak. The six districts that qualify for 40% coverage in Denizli are Buldan, Sarayköy, Pamukkale, Babadağ, Merkezefendi, Serinhisar.

The success fee will be calculated as 5% of the actual cost of the specific exploration well after the well has been completed and tested. The success fee guarantee will be based on an estimate of the AWC and approved by the RSM Consultant and RSM Unit. If a well is successful and the Beneficiary proceeds with a subsequent well under the program, a new success fee guarantee will be put in place prior to the start of drilling the subsequent well. The final financial settlement will be done at the end of the program.

After drilling of three wells has been completed, an option to extend the Beneficiary Agreement (BA) to a fourth and fifth well may be provided to the Beneficiary. The RSM would only cover 40 percent of actual AWC in case of failure of the fourth and fifth wells regardless of location. If drilling of additional wells (wells 4 and 5) is approved by the RSM Unit, the success fee for those wells will be 10% of the actual AWC.

An agreed upon **well testing protocol** (see Section 6 and Appendix 5) will be used to establish the output of the well which will then be compared to the pre-agreed output that the well must provide to meet the needs of the Beneficiary's BP. What constitutes a successful versus an unsuccessful well will be based on an output threshold (in terms of MW_e gross installed capacity for a power plant and or MW_{th} for direct use) for each well that is contractually agreed between the RSM Unit and the Beneficiary pursuant to the needs of the Beneficiary's BP. The output criteria for each well will be established based on a combination of enthalpy and flow rate of the geothermal resource at a minimum well head pressure (for two phase wells) or drawdown (for liquid wells) at a maximum well depth. For slim holes drilled for temperature confirmation, temperature at specific depths will be the success criteria. The success criteria will be unique for each well. The Beneficiary's BP will be presented to the RSM as part of the RSM application process.

The RSM pay-out, which reimburses the Beneficiary for a percentage of actual AWCs in the event of an unsuccessful well will be limited to the failure of two wells. The RSM coverage for a particular Beneficiary will thus be discontinued after any two well failures. The maximum pay-out from the RSM for a single project will be USD 4 million.

The Beneficiary can terminate its RSM Program involvement after completion of the well currently being drilled and before the start of the next consecutive well identified in the program. Actual incurred costs based on AWCs will be verified by the RSM based on the reports provided by the Beneficiary.

The Beneficiary will account for the actual drilling costs (and when applicable, the exploration study costs) through supporting documentation consisting of certified payments of invoices. This information will be provided to the RSM Unit within predetermined time frames as specified in the BA. Payment certification requirements (i.e., proof of payment) and proof of physical receipt of goods and services will be established in the BA between the RSM Unit and the Beneficiary.

Summary of RSM Terms and Conditions:

- Drilling program can include slim wells, production-size exploratory wells, or a combination thereof.
- Coverage for unsuccessful wells:

Table 2 – Pay-out scheme from the RSM

Well number	Selected regions in Aydin, Denizli, Manisa	Other provinces
1	40%	60%
2	40%	60%
3	40%	60%
4	40%	40%
5	40%	40%

- Beneficiary will pay a 5% “success fee” on actual well cost only when the well is successful. For wells 4 and 5, the success fee will be 10%.

Triggers for termination of RSM BA:

- Drilling of two unsuccessful wells.
- RSM pay-out reaches USD 4 million.
- CO₂ concentration in fluid of any well will result in emission levels more than the value of the year prior to the year when the drilling was completed.⁶
- Failure of Beneficiary to comply with terms and conditions of the BA.
- Failure of Beneficiary to comply with World Bank Anti-Corruption Guidelines⁷ and Turkish legislations.

1.4 Duration of the RSM

The RSM is anticipated to remain operative for a period of seven years (2018-2024) through the execution of three application rounds but may be extended if available funds are not exhausted by the end of the period. The duration of the RSM may be shortened if funds are depleted faster than anticipated.

1.5 Parties of the RSM

The TKYB, through its Engineering Department, is the Project Implementation Agency for the RSM. TKYB's RSM Unit will be supported by a Technical Consultant for management and implementation of the RSM (RSM Consultant). The World Bank, as Trustee of the CTF, will be responsible for carrying out supervision of RSM implementation by TKYB.

Figure 2 below shows the different parties involved in the implementation of the RSM:

⁶ See following link for the relevant emission factor based on 2020 data, as published on 20/09/2022, namely 555 g/kWh: <https://enerji.gov.tr/evced-cevre-ve-iklim-turkiye-ulusal-elektrik-sebekesi-emisyon-faktoru>

⁷ Available at: <https://ppfdocuments.azureedge.net/3682.pdf>

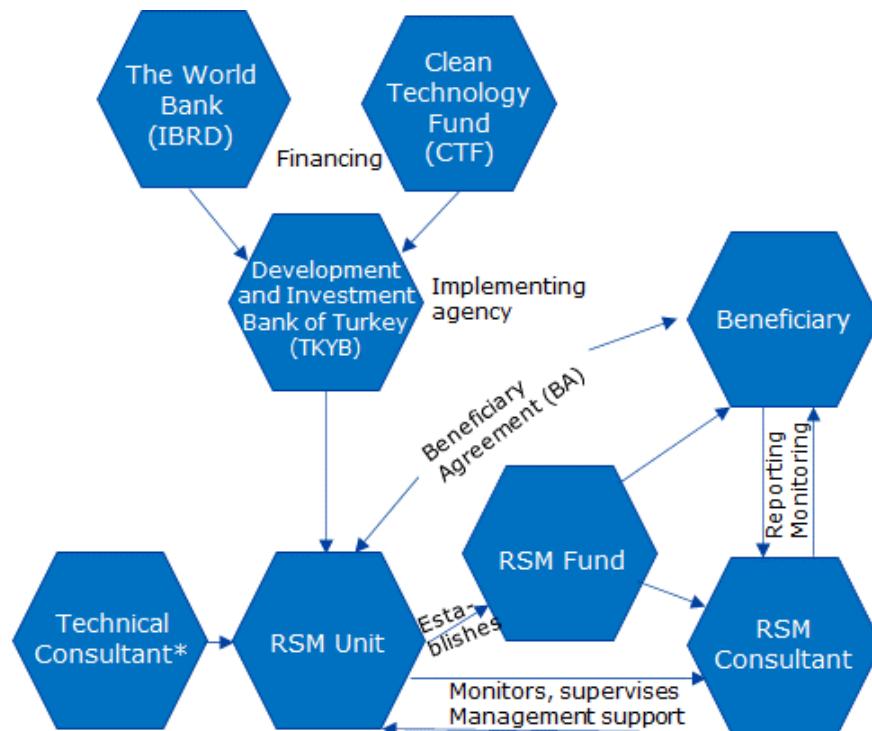


Figure 2 – Overview of RSM parties

* Technical Consultant is a third-party professional to TKYB.

1.6 Eligibility

1.6.1 Eligible Beneficiaries

For a firm to qualify for coverage under the RSM Program, a valid **exploration license** is required. This license should be valid until the end of the drilling program; however, a license that remains valid for 18 months from the application date will be accepted. The 18-month duration also includes the time necessary for the license holder to extend the exploration license by an additional year. Less than 18 months of remaining validity on the license may be acceptable in cases for which the drilling program can be completed in a shorter period.

A geothermal firm which has been active in Türkiye and has undertaken exploration activities in the past and that holds an **operation license** (i.e., for direct use of geothermal hot water in greenhouses) will generally be allowed to participate in the RSM Program for these additional exploration activities.

The RSM Unit working with the RSM Consultant will screen proposals of Applicants based upon a clear and predefined set of technical, financial, and corporate eligibility criteria. This process ensures that Applicants have carried out the appropriate surface exploration studies and have the necessary technical and financial capacity to complete the well drilling and testing program as set forth in their application.

1.6.2 Acceptable Drilling Costs used for Calculating RSM Pay-out

Applications for RSM coverage will be considered once the Applicant has identified optimal locations for exploration wells and drilling targets at depth. Exploration drilling programs supported by the RSM may include up to three full size production wells or up to three slim hole wells or a combination thereof. Acceptable drilling costs used to calculate the RSM pay-out when an unsuccessful well is drilled may include mobilization

and demobilization of drilling rigs, cuttings analyses, well logging and well testing and environmental management costs. Infrastructure costs required for exploration drilling (e.g., access roads, water supply) will not constitute an AWC and will not be covered. In locations which include 60% coverage, exploration study costs approved by the RSM Consultant and RSM Unit for power generation and direct use applications will be included as described in Section 1.3 above and Section 5.2.

The RSM will only support AWCs as described above and as stated in more detail in Section 5.2.

The same developer can submit multiple applications for drilling programs related to different license areas, as long as they constitute independent projects.

2 Application Procedure

2.1 Two-stage process

RSM applications will go through a **two-stage process**. In the first stage, Expressions of Interest (EoI) will be submitted. These EoIs will be evaluated as set out in Section 2.3. The EoI evaluation will be used to determine if the Applicant has a potentially promising application and if the drilling program in the context of the BP is viable. In the second stage, Applicants will be shortlisted and invited to prepare a full proposal in line with the criteria as set out in this BM. The full proposal will be scored and ranked as explained below in Chapter 3.

2.2 Call for EoI

Expressions of Interest (EoI) will be accepted **within 4½ weeks (between Tuesday 11/04/2023 until Friday 12/05/2023)** after the formal call for EoI is published. The call for and evaluation of EoIs will be completed through the shortlisting of at least eight (8) valid EoIs. Shortlisted EoIs will be invited to prepare a full proposal for consideration of entry into the RSM which occurs upon execution of a BA. The total number of RSM coverage BAs between the RSM and Beneficiaries, will be capped by the total budget available to cover the anticipated number and value of unsuccessful wells that may occur.

The RSM Cycle for the third RSM round with call for EoI and full proposal application round is illustrated in Figure 3.



Figure 3 – RSM Cycle – Third application round. The call for EoI has been advertised and will be opened with the Consultation Workshop held on 11/04/2023.

EoIs and applications will be made either via the RSM Website or via a dedicated email address (see below), after which the RSM Unit and RSM Consultant will perform the specified evaluations.

In the third RSM round the applicant's EoI must demonstrate that the applicant can qualify for RSM Program participation and enter into a BA. Demonstration of the applicant's geothermal program and general qualifications will be achieved by answering the questions and providing the requested data (to the greatest extent possible) as specified in the EoI Template.⁸ Applicants are encouraged to provide any relevant information in addition to that which is identified in the EOI Template to help assure being shortlisted. Generally speaking, successful applicants will need to demonstrate that they will fulfil the following qualification criteria as further identified in the EOI Template.

1. Hold valid exploration licenses, permits and certificates.
2. Have carried out surface exploration, including geological, geophysical, and geochemical exploration. As pointed out above, cost of surface exploration studies in areas with 60% coverage and projects proposing direct use applications can be included in the AWC.
3. Have constructed initial Conceptual Geothermal System Model (simple or extensive)
4. Have selected drilling targets (depth, flow rate, temperatures), well types (shallow/deep and vertical/directional) and conceptual well design.

⁸ The EoI template will be published on the RSM website.

5. Have prepared a business plan.
6. Have completed the TKYB form as available from the RSM website.

As environmentally sustainable geothermal utilization is one of the key objectives of future geothermal development, expected CO₂ emissions from successful wells need to be below grid emission factor of 555 g CO₂/kWh.⁹

The EoI should demonstrate that the following information is available:¹⁰

- Geothermal – technical (see Appendix 2):
 - Conceptual model (see 3. above, which is based on 2. above) and list of data utilized to develop the conceptual model.
 - Drilling plan (see 4. Above)
 - References demonstrating previous drilling experience and CVs of key experts.
 - If there are already exploration wells, provide an indication of the information from these wells.
- Business Plan:
 - The structure of the Beneficiary's consortium or Joint Venture: description of the Beneficiary.
 - Here submission of financial statements of the past 3 years are requested, namely balance sheets, profit/loss statements and income statements.
 - This should be submitted for the proposed special purpose entity and the group this belongs to.
 - Feasibility of the drilling plan for direct use facilities or power plants, this should include the following data:
 - Target output per well in MW_{th} for direct use and MW_e for power production.
 - Proximity to other present or planned geothermal exploration wells.
 - Number of production and number of reinjection wells proposed.
 - Number of wells anticipated under the RSM.
 - Average investment cost per well.
 - Total investment cost of power plant or direct use facility.
 - Operating costs on annual basis.
 - Average estimated sales price for the first 10 years and from year 11 onwards.
 - Percentage of equity to be committed to total investment costs.
 - Expected IRR and NPV (at 8% discount rate).
 - If any pre-feasibility study or socio-economic analysis are available, applicant should provide final reports.
- Environmental and Social Considerations:
 - Environmental issues:
 - Information on Project Status with Respect to Annex II of the Turkish Environmental Impact Assessment Regulations and classified as Category B Project under World Bank Environmental and Social Safeguard Policies.
 - Distance to nearest international/national protected area/sensitive habitats.
 - Distance to nearest area of cultural heritage and its sensitivity.
 - Proximity to settlements (residential, commercial, and public).

⁹ In the case where only very short-term flow testing (couple of days) reveals higher CO₂ output, it has to be estimated how likely it is that such results are representative for the long-term emission. It is known that CO₂ output can be very high initially, but often decreases rapidly. Therefore, initial CO₂ estimates should be taken provisionally, unless long-term (few weeks) flow testing is possible.

¹⁰ The call for EoI and the EoI template can be found at the RSM website.

- Proximity to water bodies, irrigation structures and designated water supply zones for groundwater and surface water.
- Distance to nearest agricultural area.
- Permits available.
- Social issues:
 - Land use status in relation to land based livelihoods; use for agricultural purposes etc.
 - Land acquisition needs (whether voluntary purchase or expropriation will be sought).

2.3 Evaluation of the EoI

EoI's will be screened through application of the following steps.

First, the EoIs **will be screened for completeness**, including licenses, permits (see Appendix 1 for details) and certificates. Incomplete applications will be rejected and not shortlisted at the EoI stage.

TKYB -with support of the RSM Consultant- will also evaluate the projects in accordance with Turkish legislations and in terms of institutional capacity of the Applicant. During the EoI phase, TKYB will screen the EoIs for the demands which are not in compliance with the WB's general rules and regulations. Legal, Financial and Commercial status of the companies as it pertains to their adequacy in the identified business. The life history of the business will also be assessed based on a review of various reliable information sources.

Secondly, the EoI evaluation process will assess the proposed drilling location of the Applicant from three perspectives:

1. Geothermal – technical
2. Business Plan
3. Environmental and Social Considerations

The (preliminarily) **surface exploration** and conceptual modelling included in the EoI will be reviewed to confirm a positive indication of the presence of a viable geothermal resource in the license area. This step of the evaluation process will concentrate on two main aspects of the Applicant's program which include: a) the credibility of the conceptual models based on the surface exploration data and b) the intended use of the geothermal energy as described in the business plan.

EoIs for projects where the geoscientific exploration data does not support the existence of a viable resource that meets the intended use identified in the BP will be rejected at this stage.

The viability of the Business Plan will be reviewed to verify the feasibility of the drilling plan based on the identified uses and the financing strength of the applicant, including their ability to finance the drilling plan.

The availability of the regulatory permits for environmental impact assessment and for land use as well as the potential environmental and social risks/impacts will be considered. In addition, Applicants institutional capacity to manage the environmental and social risks and impacts following the national regulatory framework and WB's environmental and social standards will be evaluated.

3 Evaluation Criteria for full proposals

At the end of the EoI evaluation process, it is anticipated that at least 8 applicants will be shortlisted and invited to submit a full proposal. Shortlisted applicants will be invited to a dedicated training workshop which will serve to guide them through the requirements necessary to develop a full proposal. The training workshop will include a session on environmental and social requirements and provide solutions for the proposals to be adequate from environmental and social perspectives. The workshop will also serve to identify the steps leading to an efficient application for the land use permit that was shown to be a stumbling block in the first and second RSM application rounds.

For consideration of becoming a Beneficiary of the RSM program, the shortlisted applicant will be given the opportunity to deliver a full proposal that must fulfil the requirements outlined in this chapter. Note that in the context of this chapter the words “application” and “proposal” shall have the same meaning.

3.1 Content of full proposals

The following table identifies the content of the full proposals that the Applicant will be asked to provide to the RSM (Table 3). These requirements are further detailed in Section 3 Evaluation Criteria. These can be submitted in English (preferably) or Turkish.¹¹

¹¹ Call for EoI will also be translated to Turkish, as well as the BA for the full proposal application dossier.

Table 3 – Contents of the full proposals to RSM

Item	Requirement
1	Certificate of incorporation as evidence that the Applicant exists as a legal entity. In the case of joint ventures, all partners need to submit certificates of incorporation.
2	Proof of necessary permits, licenses (including exploration licenses) and unobstructed rights to the concession (see Appendix 1 for details).
3	Surface exploration information and data that meet RSM requirement for participation in the program (see Appendix 2 for details).
4	Conceptual model and resource capacity evaluation (see details in Appendix 3).
5	A professionally prepared BP showing how the geothermal energy will be utilized and geothermal resource energy requirements necessary to meet such plan (see Section 3).
6	A professionally prepared drilling and testing program for the exploration wells, including cost estimates, and technical specifications for drill rigs to be used (see Section 5 and Appendix 4 and 5).
7	The financials and governing documents of the legal entity that will be the Beneficiary of RSM funds as well as clarification of any liabilities facing the legal entity.
8	<p>Environmental and Social Considerations:</p> <p>Permits:</p> <ol style="list-style-type: none"> 1. Presence of an available EIA Not Required Decision or EIA Positive, 2. Presence of applicable land use permits for the exploration well locations or if not available at the time of the proposal, a clear informative note on the land acquisition scheme of the Applicant. <p>Environmental and Social Safeguards:</p> <ol style="list-style-type: none"> 1. Filled up Screening Checklist (See Annex 10A) 2. Environmental and Social Management Plan (ESMP) developed following the WB requirements (See Annex 10B and Annex 12A) 3. Stakeholder Engagement Plan (SEP) developed following the WB requirements (See Annex 10C and Annex 12B)
9	A well-documented statement of technical capacity of the legal entity as it pertains to the successful management of the project, including key personnel and references (see Appendix 6).
10	TKYB Application Forms (as published on the website rpmjeoturkiye.com)

The data submitted to the RSM should be in digital form, such as PDF, Word, Power point, Excel format or as scanned figures and text. All documents shall be delivered through a link on the RSM website or via lise.RSMproject@gmail.com. Paper documents are not accepted, unless digitally scanned.

Tentative English translation of key documents in Turkish is appreciated.

In accordance with Table 3 above, the following section identifies the content of the full proposals to be submitted to the RSM for consideration of admission into the program and the process through which they will be evaluated.

3.2 Proposal evaluation: Scoring and ranking of viable projects

The evaluation of proposals will utilize all listed items in Table 3 above. The evaluation process is shown schematically in Figure 4 (below). Applications will be given scores for each category as detailed below.

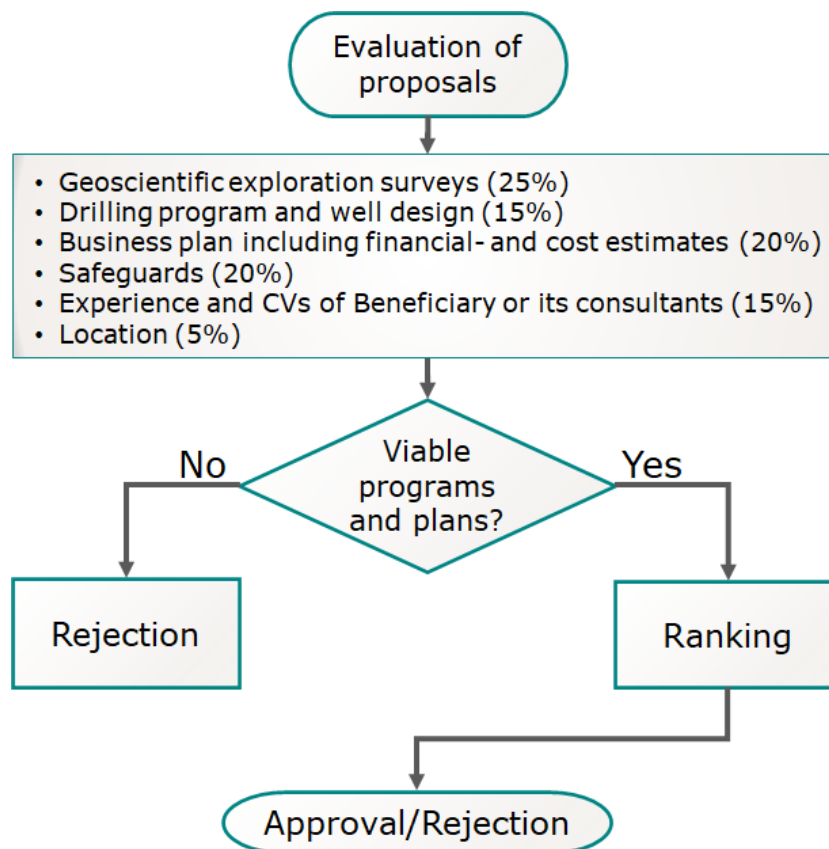


Figure 4 – Evaluation process of the proposals

The proposals will be evaluated using the scoring and ranking protocol described for each of the following categories of information:

1. Geoscientific exploration data and the resulting conceptual model
2. Drilling programs and well designs
3. BP, including financial- and cost estimates
4. Environmental and social considerations (Safeguards)
5. Experience and CVs of the Applicants and its consultants, if any
6. Locations

Each of the six categories of information will be evaluated separately and given a score from 0 to 100.

Table 4 – Evaluation and ranking of applications presenting viable geothermal resources will be based on the five categories listed in the table. Weight of each category in the evaluation process is also presented in the table.

Item	Category	Weight %
1	Geoscientific exploration surveys and conceptual model	25
2	Drilling program and well design	15
3	BP including financial- and cost estimates	20
4	Environmental and social considerations (Safeguards)	20
5	Experience and CVs of the Applicant and its consultants, if any	15
6	Location	5

The total score for each application will be derived by taking the given score for each category of information (0 to 100), multiplying it times the weighted percentage as shown in Table 4 and Figure 4 for the category in question and then summing the weighted scores of the six categories to obtain the total application score. Applications with a total score of 70 or greater will be priority ranked based on total score as compared to the other applications. Among the shortlisted applicants, the Beneficiaries who fulfill the signing requirements i.e., agreed success criteria, WB approved site-specific E&S instruments (ESMP, SEP, other social reports if necessary) and available license/s, land use permits and agreements in place, sign the Beneficiary Agreement first and will be given priority on a first come first serve basis within the limits of the overall available budget of the RSM program.:-

The following sections identify the proposal evaluations for scoring and ranking each of the six categories of information identified in Figure 5 above.

3.2.1 Geoscientific exploration data and conceptual models (25%)

As the RSM is eligible for developers holding licenses for different resources and different utilization approach, relevant exploration data may vary between projects. Thus, appropriateness of the methods used will be evaluated in each case. The items listed in Table 5 will be used to evaluate and score the geoscientific data and the resulting conceptual model. Item 2 in the table, "Completeness of surface exploration" will be used for evaluation if important methods in one or more geoscientific disciplines is missing (see Appendix 2). Data quality (item 3) will be evaluated where possible. Quality of conceptual models (item 4) will be evaluated based on data interpretation and completeness of the models. The conceptual model shall address the items listed in and described further in Appendix 3. Evaluation of preliminary resource assessments will be based on the assumptions used.

It is anticipated that there will be certain EoI submittals which include minimum surface exploration and modeling data that may indicate the presence of a potentially viable resource but is lacking certain studies. Under these conditions and upon the request of the Applicant, the RSM Consultant will work with the Applicant to identify the additional surface exploration and study requirements necessary to support the likelihood of finding a geothermal resource. Under such conditions, the Applicant can choose to perform the additional surface exploration and studies until the proposal submission date, which could lead to a higher score of the Applicant during proposal evaluations. The costs of these additional studies will be part of the AWC (see for details Section 5.2).

Table 5 – Items to be evaluated within the section of geoscientific exploration and conceptual models

No.	Items to be evaluated	Points
1	Appropriateness of exploration methods used	20
2	Completeness of surface exploration studies	20
3	Data quality	20
4	Quality of conceptual models and applicability of drilling targets	30
5	Preliminary resource assessments	10

3.2.2 Drilling programs and well designs (15%)

Requirements for well design and drilling programs are specified in Section 5. Drilling programs need to be detailed and in line with industry best practices, i.e. *New Zealand Standard, 2015: Code of practice for deep geothermal wells* (Standards New Zealand, Wellington, NZ, 102 pp.). In addition, Applications shall present technical specifications for the drilling equipment. The items listed in Table 6 will be used to evaluate and score drilling programs and well designs (see also Appendix 4 for more details on the drilling program).

Table 6 – Items to be evaluated within the section of drilling programs and well designs

No.	Items to be evaluated	Points
1	Well design and applicability of the design	30
2	Rig requirements based on the well design	10
3	Drilling program (including estimated drilling time and drilling fluid program)	30
4	Well testing design and well testing program	30

3.2.3 Business Plan (BP) including financial- and cost estimates (20%)

To evaluate the Applicant's BP, criteria for three different types of BPs have been identified which include:

- Direct Use Geothermal Energy to Serve an Existing Business
- Direct Use Geothermal Energy to Serve a New Business
- Geothermal Energy for Grid Connected Power Generation

3.2.3.1 The following requirements and rating standards shall apply to each type of BP. Geothermal Energy to Serve an Existing Business

In the case of the geothermal energy source replacing or supplementing an existing business's energy source the following information must be supplied at a minimum:

- Legal name, legal structure, and ownership (including total registered / paid capital and share structure) of the existing business producing the geothermal energy.
- Financial statements (Balance Sheets as of December 31st; Profit and Loss Statements for the financial year) of the existing business over last 3 years (external Audit Reports must be provided, if available).
- Explanation and justification for the source of the finance to start (including site preparation such as land arrangement, access roads, connection to the grid, reinstatement etc.) and complete the drilling activities including the end of well testing.
- Proposed contractual arrangements under which geothermal energy will be sold to the existing business.
- Minimum technical requirements of the geothermal resource for the geothermal energy source to meet the minimum BP requirements. Basic technical

information (estimates): enthalpy, flow (kg/s), well head (pressure) / drawdown, installed capacity of the plant (MW_{th}), production (kWh/year).

- Letter of commitment from an authorized representative of the existing business identifying acceptance of the proposed contractual arrangements and any conditions precedent that must be met prior to the proposed BA's effectiveness.
- A professionally prepared schedule identifying the activities necessary to develop geothermal resources and to meet the requirements of the proposed energy agreement with the existing business.
- Budget and cash flow projections (throughout the whole project life cycle on annual basis including all assumptions and parameters used as open-source EXCEL file) for the CAPEX, OPEX and Revenue Stream for the project starting with the exploration of the geothermal resource through operation of the field and sale of energy to the existing business:
 - Preliminary Investment Cost Estimates, Class 4 according to AACE guidelines (land acquisition, civil works, equipment, M&E works, engineering/design/consultancy) and Financing Plan (capital, equity, internally generated funds) (replacements / reinvestments (especially for equipment / M&E) must also be taken into account) and Financing Plan (capital / loan / internally generated funds)
 - NPV and IRR of the Investment Project (discount rate of opportunity cost of capital to be used in NPV calculations must be specified – e.g., 8% p.a. in real terms)
 - Pro-forma Profit (-Loss) Statements of the Investment Project
 - Pro-forma Cash Flow Statements of the Investment Project
 - Financial Performance Ratios of the Investment Project (profitability, liquidity, asset/debt management, debt service coverage)

3.2.3.2 Geothermal Energy to Serve a New Business

In the case of a new business being established because of the positive validation of the geothermal energy source, the following information must be supplied at a minimum:

- Proposed business structure, identification of proposed owners (including total registered / paid capital and share structure) and the proposed agreements (or bylaws) under which the rights and obligations of the owners are established.
- Financial statements (Balance Sheets as of December 31st; Profit and Loss Statements for the financial year) of proposed owners (in case they are companies not real persons) over last 3 years (external Audit Reports must be provided, if available).
- Proposed contractual arrangements under which geothermal energy will be sold to the new business.
- Minimum requirements of the geothermal resource (in terms of well outputs) for the geothermal development to meet the minimum BP requirements. This is linked directly to the success criteria of exploration drilling and average expected output of wells clarified in Section 7.
- Letter of commitment from an authorized representative of the new business identifying acceptance of the proposed contractual arrangements and any conditions precedent that must be met prior to the proposed BA's effectiveness.
- A professionally prepared schedule identifying the activities necessary to develop the geothermal resource and to meet the requirements of the proposed BP.
- Budget and cash flow projections (throughout the whole project life cycle on annual basis including all assumptions and parameters used as open-source EXCEL file) for the CAPEX, OPEX and Revenue Stream for the business starting

with the exploration of the geothermal resource through the ongoing operation of the business:

- Preliminary Investment Cost Estimates, Class 4 according to AACE guidelines (land acquisition, civil works, equipment, M&E works, engineering/design/consultancy) and Financing Plan (capital, equity, internally generated funds) (replacements / reinvestments (especially for equipment / M&E) must also be taken into account) and Financing Plan (capital / loan / internally generated funds)
- NPV and IRR of the Investment Project (discount rate of opportunity cost of capital to be used in NPV calculations must be specified – e.g. 8% p.a. in real terms)
- Pro-forma Profit (-Loss) Statements of the Investment Project
- Pro-forma Cash Flow Statements of the Investment Project
- Financial Performance Ratios of the Investment Project (profitability, liquidity, asset/debt management, debt service coverage)

3.2.3.3 Geothermal Energy to Serve Grid Connected Power Generation

In the case of the geothermal energy source being used for grid connected power generation the following information must be supplied at a minimum:

- Legal name, legal structure, and ownership (including total registered / paid capital and share structure) of the business that will produce the geothermal energy and convert it into electricity.
- Financial statements (Balance Sheets as of December 31st; Profit and Loss Statements for the financial year) of the business over last 3 years (external Audit Reports must be provided, if available).
- Proposed technical and contractual arrangements under which electric energy will be delivered to the grid (i.e., any necessary transmission, substation and electrical interconnect requirements) and confirmation of electricity being sold under standard FIT.
- Minimum technical requirements of the geothermal resource for the geothermal energy source to meet the minimum BP requirements. Basic technical information (estimates): enthalpy, flow (kg/s), well head (pressure) / drawdown, installed capacity of the plant (MW_e), electricity production (kWh/year).
- Letter of commitment from an authorized representative of the new business identifying acceptance of the proposed contractual arrangements and any conditions precedent that must be met prior to the proposed BA's effectiveness.
- A professionally prepared schedule identifying the activities necessary to develop the geothermal resource and power generation plant to meet the requirements of the proposed business plan.
- Budget and cash flow projections (throughout the whole project life cycle on annual basis including all assumptions and parameters used as open-source EXCEL file) for the CAPEX, OPEX and Revenue Stream for the project starting with the exploration of the geothermal resource through operation of the field and sale of electricity under the FIT:
 - Preliminary Investment Cost Estimates, Class 4 according to AACE guidelines (land acquisition, civil works, equipment, M&E works, engineering/design/consultancy) and Financing Plan (capital, equity, internally generated funds) (replacements / reinvestments (especially for equipment / M&E) must also be taken into account) and Financing Plan (capital / loan / internally generated funds)

- NPV and IRR of the Investment Project (discount rate of opportunity cost of capital to be used in NPV calculations must be specified – e.g., 8% p.a. in real terms)
- Pro-forma Profit (-Loss) Statements of the Investment Project
- Pro-forma Cash Flow Statements of the Investment Project
- Financial Performance Ratios of the Investment Project (profitability, liquidity, asset/debt management, debt service coverage)

3.2.3.4 Additional requirements

In addition to the requirements set out above for each BP type and to support the BP estimates, a short general description of the following items is requested:

- a. For Power Generation Projects: Preliminary power plant description, indicating the type of power conversion technique to be used. The description needs to consider the likely inlet temperature and pressure, cooling techniques, NCG capturing, injection strategy, and possible mitigating measures during production, if foreseen; or
- b. For Geothermal Direct Use Projects: Preliminary description of heating application or other direct use. This should include identification of the techniques and equipment that will be used to extract heat from the geothermal resource and supply it to the end user. Basic design parameters concerning the use of an open or closed loop system with reinjection must also be elaborated.

The components listed in Table 7 below will be used to evaluate the BP, financial capacity and cost estimates for direct use and power generation geothermal energy projects, respectively.

Table 7 – BP requirements for Direct Use Geothermal Projects

Item	Requirements	Points
1	Legal name, legal structure and ownership (including total registered / paid capital and share structure) of the business that will produce the geothermal energy	10
2	Financial statements (Balance Sheets as of December 31 st ; Profit and Loss Statements for the financial year) over last 3 years (external Audit Reports must be provided, if available) for the existing business that will be purchasing the geothermal energy. In the case of a new business that will be purchasing the geothermal energy, a clearly defined business plan for the new business that demonstrates that the end product of the business will be profitable for the life of the geothermal resource.	15
3	Proposed contractual arrangements under which geothermal energy will be sold to the existing business or, in the case of a new business the contractual structure and relationship between the geothermal energy producer and the new business.	10
4	Minimum technical requirements of the geothermal resource in order for the geothermal energy source to meet the minimum BP requirements, namely basic technical information (estimates): enthalpy, flow (kg/s), well head (pressure) / drawdown, installed capacity of the heat facility (MW _{th}), production of heat (kWh/year)	10
5	Letter of commitment from an authorized representative of the existing business identifying acceptance of the proposed contractual arrangements and any conditions precedent that must be met prior to the proposed BA's effectiveness	10
6	A professionally prepared schedule identifying the activities necessary to develop the geothermal resource and to meet the requirements of the proposed energy agreement with the existing business	15

Item	Requirements	Points
7	Budget and cash flow projections (throughout the whole project life cycle on an annual basis including all assumptions and parameters used as open-source EXCEL file) for the CAPEX, OPEX and Revenue Stream for the project starting with the exploration of the geothermal resource through operation of the field and sale of energy to the existing business	30

Table 8 – BP requirements for Grid Connected Power Generation Geothermal Projects

Item	Requirement for Grid Connected Power Generation Projects	Points
1	Legal name, legal structure and ownership (including total registered / paid capital and share structure) of the business that will produce the geothermal energy and electric power.	10
2	Financial statements (Balance Sheets as of December 31 st ; Profit and Loss Statements for the financial year) over last 3 years (external Audit Reports must be provided, if available) for the new business that will be selling the grid connected generated power from geothermal energy under the FIT regime.	15
3	Proposed contractual arrangements under which geothermal energy will be sold via the grid connected power generation under the FIT regime.	10
4	Minimum technical requirements of the geothermal resource in order for the geothermal energy source to meet the minimum BP requirements of the power plant for profitable sale of electricity under the FIT, namely basic technical information (estimates): enthalpy, flow (kg/s), well head (pressure) / drawdown, installed capacity of the plant (MW _e), production of power (kWh/year)	10
5	Letter of commitment from an authorized representative of the new business identifying acceptance of the proposed contractual arrangements and any conditions precedent that must be met prior to the proposed BA's effectiveness	10
6	A professionally prepared schedule identifying the activities necessary to develop the geothermal resource and power plant to meet the requirements of the FIT	15
7	Budget and cash flow projections (throughout the whole project life cycle on an annual basis including all assumptions and parameters used as open-source EXCEL file) for the CAPEX, OPEX and Revenue Stream for the project starting with the exploration of the geothermal resource through operation of the field and sale of grid connected electric energy under the FIT	30

3.2.4 Environmental and social considerations - Safeguards (20%)

It is very important that the Applicants have obtained the relevant permits for EIA and land use for the Projects to start on site without any constraints. The availability of an advanced ESMP and SEP as part of the full proposal is considered crucial in order to demonstrate how the Applicants will manage the environmental and social impacts of their exploration activities following the WB environmental and social requirements.

Table 9 – Items to be evaluated within the safeguards section

No.	Items to be evaluated	Points
1	Having obtained "EIA not required" or "EIA Positive" decision for the exploration wells	25
2	Having obtained land use permits for exploration well location/s or having proposed a clear land acquisition plan for exploration well location/s *	25
3	Having filled up a Screening Checklist	10

4	Having developed an Environmental and Social Management Plan (ESMP) following the WB requirements	25
5	Having developed a Stakeholder Engagement Plan (SEP) following the WB requirements	15

* The ESMP prepared for the project should initially indicate the land related impacts of the relevant project components. During the time of ESMP preparation, if the land is already rented or acquired by the applicant the ESMP should clearly indicate this, and applicant should prepare an Ex-Post Social Audit to showcase how the land is acquired/rented. If the lands have not yet been acquired or rented for use during ESMP preparation, then the report should indicate how the applicant plans to acquire land for exploration purposes. If i) there is no public interest decision and ii) a willing buyer/seller transaction is to take place, then the applicant is not requested to prepare an Abbreviated Resettlement Action Plan (ARAP). However, if there is a need to expropriate the land through application of law; the applicant will be requested to prepare an ARAP. In cases where the applicant plans to rent the land, rental agreements and the consent of the landowner/user will need to be submitted as justification.

3.2.5 Experience of Applicant and its consultants (15%)

Experience of Applicants (and/or its key consultants) as a company engaging in geothermal exploration, drilling and utilization, but also with environmental and social issues will be evaluated based on information in each application, see Table 10. Applicants shall present a team of experts that will be responsible for the implementation of the requirements of the BA. The team will be responsible for the field activities, reporting and communication with the RSM Unit and the RSM Consultant.

The Applicant's team must consist of specialists relevant for the project. It is possible that one individual may be responsible for more than one of the required roles (see Appendix 6). Each application shall include a list of the experts proposed for the team, including CVs for key experts, demonstrating their relevant experience and providing details of their experience in similar projects. One of the experts shall be nominated as a team leader. Ideal team composition, experience and education is presented in Appendix 6.

Table 10 – The table presents how experience and team composition will be evaluated

No.	Items to be evaluated	Points
1	Specific experience of the Applicants (and/or its consultants) in geothermal exploration and environmental and social management	30
2	Relevant experience of key experts	50
3	Team composition	20

3.2.6 Location (5%)

Proposed projects outside Aydin, Denizli and Manisa¹² will be given an additional 5% points to expedite geothermal development in other regions, rather than the already utilized geothermal areas.

4 Illustration of pay-out and success fees

The RSM program will cover a pre-defined percentage of actual AWCs in case a well is not meeting the pre-agreed success criteria as stated in the BA. Conversely, a success fee of the actual well costs must be paid by the Beneficiary, if the drilled well meets the pre-determined success criteria. The success criteria are described in detail in Section 7 (success criteria).

¹² See footnote 4.

The application period for the third round opens on Tuesday **11/4/2023** with a call for EoI and these will have to be submitted until Friday **12/5/2023**. In the third round, it is expected that a maximum of four (4) projects will be supported, based on the uncommitted balance in the RSM.

In this section, the RSM pay-out for an unsuccessful well, the success fee for a successful well and the triggers for termination of BA are described. A table giving an overview of all possible combinations of successful and unsuccessful wells within the RSM program is then presented as an example.

4.1 Reimbursement process of costs of an Unsuccessful Well

In case of an unsuccessful well i.e., the success criteria are not fulfilled, the RSM program will cover a pre-defined percentage of the actual AWC incurred by the license holder. The RSM pay-out of said costs is based on the actual AWCs which must be proven by the Beneficiary through documentation of certified expenditures. **For the documentation invoices, bank transfer vouchers and payment vouchers as well as bank transaction statements are acceptable documents. The time-limit for partial coverage payment by the RSM Unit is 10 business days from the receipt of a properly submitted payment request in compliance with the terms of this BA under approval of TKYB's General Manager. The Success fee will be accumulated in a special escrow account at TKYB opened.** The well costs will be monitored through reconciling the costs incurred with the documentation of certified expenditures by the RSM Unit. The AWCs are described in Section 5. The pre-defined percentage of the actual AWCs will be 40 percent for projects located within the administrative boundaries of Aydin, Denizli and Manisa¹³ and 60 percent in those located elsewhere in the country. The RSM program is based on a standard three well exploration program with an option to drill a 4th and a 5th well upon the RSM Unit's approval. The decision of the RSM Unit will be based on the results of the first three wells and the availability of funds. The RSM pay-out in the event of an unsuccessful 4th or 5th well is 40% of the actual AWCs, regardless of where the wells are in the country. The maximum reimbursement for each project with up to five wells is USD 4 million. The RSM Unit is responsible for the authorization of the RSM pay-out. Table 11 lists the details concerning coverage for a standard three well program, which has a provision for a 4th and 5th well. Figure 5 shows the geographical coverage of the RSM.

Table 11 – Pay-out scheme from the RSM and the success fee

Well number	Selected districts in Aydin, Denizli, Manisa	Other provinces	Success fee
1	40%	60%	5%
2	40%	60%	5%
3	40%	60%	5%
4	40%	40%	10%
5	40%	40%	10%

¹³ See footnote 4.

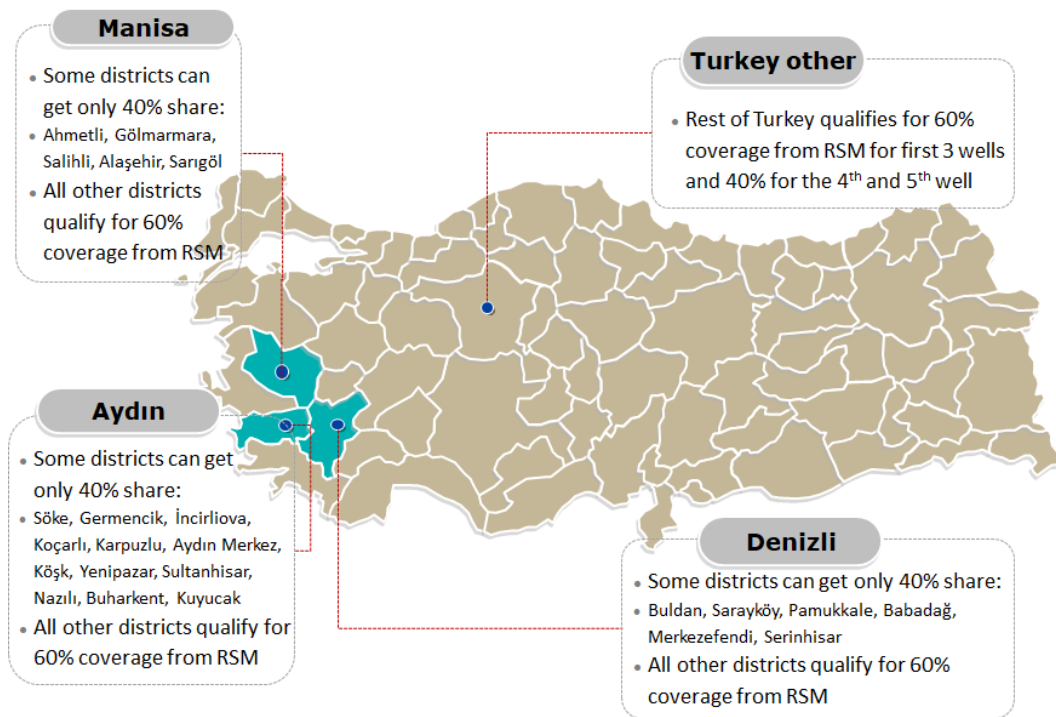


Figure 5 – Geographical coverage of the RSM

In addition to the above stated criteria, the CO₂ emission from any given well shall not exceed 555 g/kWh based on the requirements of the Clean Technology Fund (CTF). This is further described in Section 7 (success criteria).

4.2 Administration Fee

Pursuant to the terms and conditions of the CTF Grant Agreement between the IBRD (acting as an Implementing Agency of the Clean Technology Fund) and TKYB, the RSM Unit shall collect a onetime fee from the Beneficiary to compensate the RSM Unit for its administrative costs of the RSM Program (Administration Fee). The Administration Fee per each well under the RSM, shall be calculated by multiplying the estimated AWCs of the Beneficiary's Drilling Program as set forth in Section 5.2 times the factor 0.006 (0.6%) plus the resulting tax liability (BITT-Banking and Insurance Transaction Tax). The Administration Fee shall be paid by the Beneficiary into TKYB Account before signing the BA. The Administration Fee shall not be corrected to the actual AWCs upon completion of the RSM Program. For more details, see appendix 8, Draft BA.

4.3 Success fee

In case a well is deemed to be a successful well when judged against the success criteria set forth in the BA, the Beneficiary shall be obligated to pay a 5% (five percent) "Success Fee" of the actual AWCs. Thereupon, the Beneficiary needs to provide a success fee guarantee prior to signing the BA, either by providing a guarantee letter / letter of credit or by establishing an escrow account that can be drawn in case of non-payment. The amount of the success fee guarantee is based on the drilling costs proposed in the BP of the Beneficiary and accepted by the RSM Unit. In case the success fee becomes payable by the Beneficiary to the RSM, the Beneficiary shall, within 10 business days from the date of a written notice from the RSM Unit, pay the success fee. The success fee will be accounted for in a separate escrow account of the RSM established for success fees only.

As already described above in Section 4.1, the BA of a standard three well program has a provision that provides the option to have a 4th and 5th well. In the case of a successful evaluation of the Beneficiary's request by the RSM Unit, to extend its drilling program, the Beneficiary must adapt its success fee guarantee. Therefore, the success fee for well 4 and 5 is 10% of the actual AWCs. Table 11 lists the success fee for the successful wells the Beneficiary must pay.

If flow testing leads to CO₂ emission higher than 555 g/kWh, then the success fee is waived, and the program terminates (see Section 7 on success criteria for more details).

4.4 Triggers for termination of the BA

The following situations will trigger the termination of the BA:

- Drilling of two unsuccessful wells.
- RSM Pay-out reaches USD 4 million.
- CO₂ concentration in fluid will result in emissions more than 555 g/kWh (see Section 7).
- Failure of Beneficiary to comply with the schedule as established in the BA unless reasons for non-compliance are well justified.
- Failure of Beneficiary to comply with WB Anti-Corruption Guidelines¹⁴ and Turkish legislation.
- The Beneficiary has the right to terminate the BA after completion of the well being drilled and before drilling begins on the next consecutive well.
- For the success of the use of available budget of the RSM Program, the Beneficiaries are obliged to follow the timeline for the start of site activities and drilling given in the BA to be signed off. If the Beneficiary could not follow the timeline agreed within the BA, the BA will be terminated as stipulated in the BA.

Table 12 gives an overview of all potential outcomes of the RSM program, assuming that between one and five wells will be drilled. In total 30 possibilities were identified. Within the table a successful well is labelled as (S) and an unsuccessful well as (U). The red bars indicate that the BA stops due to two unsuccessful wells, otherwise the Beneficiary stops based on their own assessment and for their own reasons.

¹⁴ Available at: <https://ppfdocuments.azureedge.net/3682.pdf>

Table 12 – Details of all potential combination of successful und unsuccessful wells that can occur within one RSM drilling project

Case ID	Well 1	Well 2	Well 3	Well 4	Well 5
1	S				
2	U				
3	S	S			
4	S	U			
5	U	S			
6	U	U			
7	S	S	S		
8	S	S	U		
9	S	U	S		
10	S	U	U		
11	U	S	S		
12	U	S	U		
13	S	S	S	S	
14	S	S	S	U	
15	S	S	U	S	
16	S	S	U	U	
17	S	U	S	S	
18	S	U	S	U	
19	U	S	S	S	
20	U	S	S	U	
21	S	S	S	S	S
22	S	S	S	S	U
23	S	S	S	U	S
24	S	S	S	U	U
25	S	S	U	S	S
26	S	S	U	S	U
27	S	U	S	S	S
28	S	U	S	S	U
29	U	S	S	S	S
30	U	S	S	S	U
S	Successful well				
U	Unsuccessful well				
	RSM Contract stops due to two unsuccessful wells				

5 Well design and drilling programs

A professionally prepared and detailed Drilling Program and Well Design is an essential component of any RSM application. The well design and drilling program must fit the actual situation in the field, the infrastructure, environmental aspects, and the drilling license. The associated costs must be reflected in the BP and the associated financial analysis (see BP requirements, Section 3.2.3).

5.1 Well design and drilling program

The well design and drilling program need to be detailed and prepared according to industry best practices (e.g. the New Zealand Standard, 2015: Code of practice for deep geothermal wells, Wellington, NZ, 102 pp.). The NZ Code of Practice is widely used around the world and is considered the industry standard in geothermal drilling. The code sets out standards for design and work practices necessary to ensure the safe drilling (both for personnel as well as environmental safety) and operation of wells that penetrate geothermal reservoirs, especially for high temperatures. It is based on long, worldwide experience in geothermal development. The code offers guidance for

designing of wells, drilling of geothermal wells as well as operation. This includes preparation of the drilling site, drilling equipment, tools, and materials.

While carrying out the drilling program requires a drilling contract to be in place, a drilling contract does not need to be in place upon application to the RSM Program.

Appendix 4 includes a general list of items that should be addressed in a Drilling Program document, irrespective of the type of well to be drilled. There may be cases where some of the listed items do not apply, depending on the type of well to be drilled and the characteristics of the geothermal resource to be drilled.

5.2 Overview of Drilling Program and AWCs

Applicants shall estimate the costs for their proposed drilling program in line with the Well Cost Guidelines (WCG) provided in Appendix 4, which specify the distribution of the cost structure for standard drilling cost items.

The WCG outlines the estimated allowable percentage of cost for the listed items for different types of well diameters and depths. An agreement between the RSM Unit and the Beneficiary on AWCs will use the WCG percentages as a frame of reference and if there are significant deviations, the Applicant will need to explain and justify the cost variations. If the RSM Unit finds the cost estimate acceptable, it will be included as part of the BA. Any costs exceeding the maximum values agreed upon between the RSM Unit and Beneficiary will not be considered as an AWC and will not be subject to partial reimbursement for an unsuccessful well. The WCGs will be periodically reviewed for indexation and cost adjustment purposes during project execution.

Variable costs for budget items which are included as an AWC and which are not specified in the WCG will be separately justified in the technical application and priced in the cost estimate as an AWC.

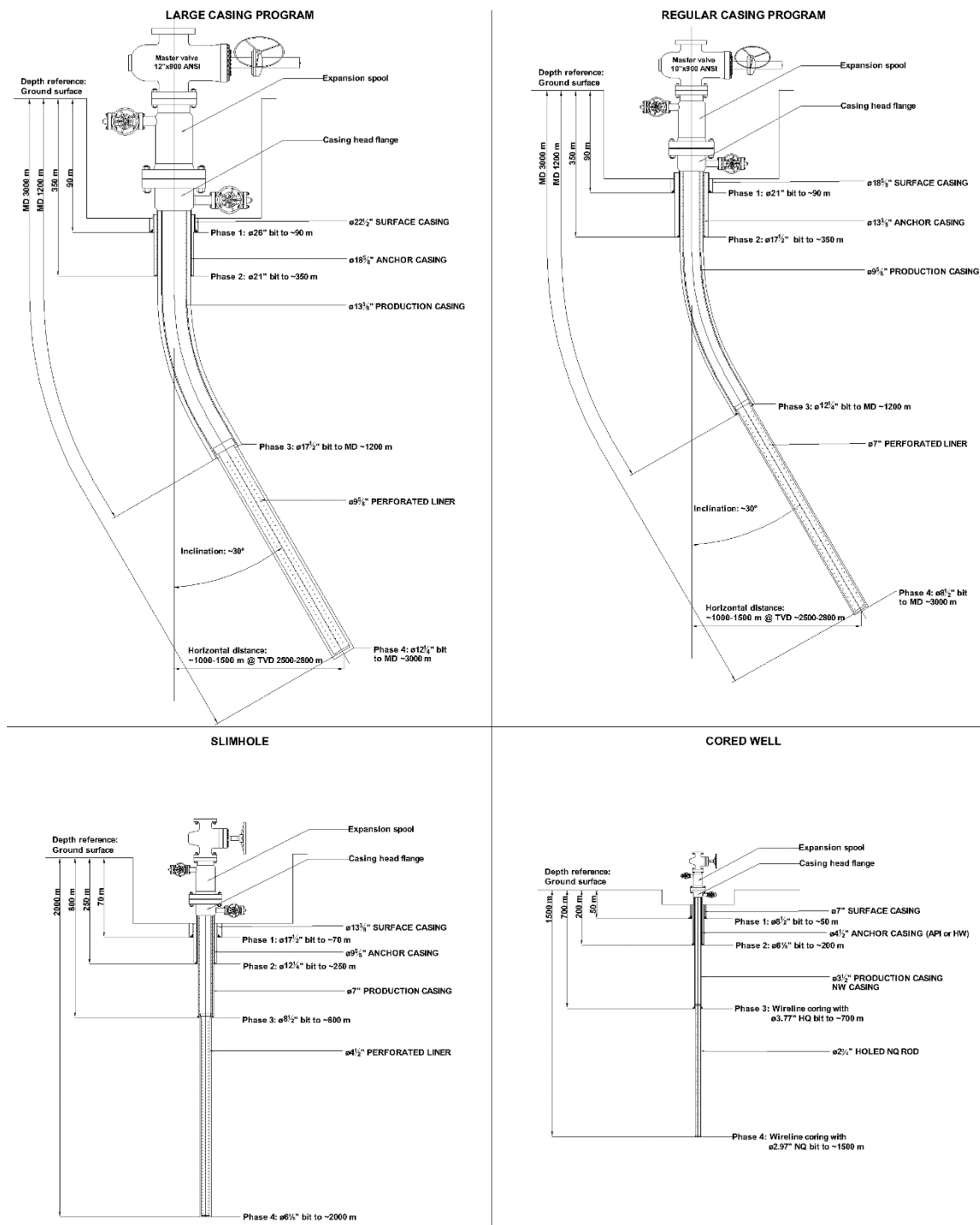


Figure 6 – Example of types of high temperature wells that may be considered as exploration wells. Low-intermediate temperature wells have often one less casing. In many cases the casings need to be deeper if the wells are very deep. The well design must consider industry best practices, as seen in the New Zealand Code of Practice for Deep Geothermal Wells. Source: Sverrir Thorhallsson, ÍSÖR.

AWCs include the following activities, which are directly associated with the drilling and testing program for the given well:

- Arrangements for the use rights of land (rental agreements/acquisition)
- Site preparation (well pads and sumps).
- Rig mobilization and demobilization costs.
- Direct drilling costs.

- Well completion.
- Mud logging and wireline logging.
- Other studies during drilling.
- Testing at the end of completion.
- Injectivity and discharge testing of the well.
- Site inspection.
- Rental or provision of drilling rigs and associated equipment.
- Providers of specialist services (e.g., reservoir engineering, stimulation, directional drilling, underbalanced drilling, drill pipe inspections, mud logging, H₂S monitoring, cementing, mud engineering, wireline services, geophysical logging and post-drilling down-hole surveys, well site geology and follow-up research on the core or cuttings (e.g., XRD, thin sections, etc.), environmentally acceptable disposal of waste including hazardous waste and material according to applicable regulations).
- Personnel, on-site accommodation, and transport including vehicle leasing or rental.
- Consumables (e.g. fuel, casing, wellheads, bits, cement, mud).
- Documentation and reports.
- Taxes, excluding VAT.
- Eligible and reasonable contingencies.
- Environmental and Social Impact Studies for the drilling activity covering both national EIA and WB safeguard procedures.
- Environmental and social management implementation costs covering both national EIA and WB safeguard procedures.
- Exploration study costs as approved by the RSM Consultant with RSM Unit only in locations for which reimbursement of unsuccessful wells is 60%.¹⁵
- Airlifting and ESP costs if when they will be used as flow-testing.

In addition, surface exploration costs can also be included under AWC under the condition that such costs will not exceed the maximum study cost of USD 300,000 for power generation drilling programs and USD 200,000 for direct use drilling programs. Moreover, the exploration studies should have been done in regions with 60% coverage for unsuccessful wells. The following three surface exploration studies are considered essential:

1. Structural and Geothermal Mapping
2. Geochemical Study & Analysis
3. Geological Studies (Soil / Gas / Hydrogeology)

For geothermal direct use applications, the following additional studies are recommended:

4. Shallow Penetration Geophysical Investigations (i.e. 2D Hammer Seismic / 2D Electric Resistivity Profiling)
5. Multiple Shallow Gradient Wells ~50 to 80 Meters Deep (Locates Main Aquifer that Brings Heat to Surface –Small Drill Rig – 2 to 4 Days per Well)

¹⁵ Approved exploration study costs shall not exceed a maximum of \$300,000 USD for power generation drilling programs and \$200,000 USD for direct use drilling programs. In the case of a three well drilling program performed in a 60% reimbursement location, the actual study costs shall be apportioned by 1/3 into each of the three well AWCs and shall be paid out upon testing of each subsequent unsuccessful well. In the event of the first two wells being unsuccessful in a three well program, the program will be terminated. Upon such termination the exploration study costs apportioned to the third well will be added to the AWC of the second well and paid out accordingly upon the failure of the second well. In the case of a two well drilling program performed in a 60% reimbursement location, the actual study costs shall be apportioned by 1/2 into each of the two well AWCs and shall be paid out accordingly for each unsuccessful well.

For geothermal power generation the following additional studies are recommended:

4. Shallow Penetration Seismic Investigations (i.e. 2D Hammer Seismic)
5. Resistivity Study Over Large Area
6. Gravity Study

All costs which are not explicitly mentioned above or in Appendix 4, will be classified as unacceptable well costs and will not be covered by the RSM. Unacceptable well costs paid by the Beneficiary include but are not limited to:

- Infrastructure costs.
- All costs more than the amount stated in the drilling and testing program estimate.
- Developer overheads (e.g. office costs, general management costs).
- Costs of temporary or permanent abandonment of wells.
- Third party liability claims, including claims by the drilling contractor and environmental damage or clean-up costs.
- Debts and provisions for losses or debts.
- Interest.
- Purchases or renting of land, buildings, or vehicles.
- Currency exchange losses (compared to the USD).
- Cost of preparing applications or cost incurred during negotiations of the BA.
- Costs for participation at meetings and workshops.
- Training and capacity building.
- Except in the case of approved exploration study costs in locations for which reimbursement for an unsuccessful well is 60%, costs incurred prior to contract signing (such as costs for studies, concessions, existing wells, etc.).

The WCG presented in Appendix 4, is based on the design parameters, presented in Figure 6, above, and in Table 16 – Table 19 in Appendix 4.

6 Well testing procedures

This section lists the requirements for well testing programs. The list applies for high-temperature wells discharging a mixture of liquid water and steam (flashing), but in general is equally applicable to lower temperature wells and slim exploration wells, with some items being optional or simply not applicable (see end of this section). In the case of lower temperature resources,¹⁶ the aid of pumps or airlifting may be needed to flow-test the wells. In the case where gas drives flow from the well, pumping or airlifting may not be required. Each application shall include a well testing program relevant for the reservoir (temperature) and well type based on the items listed in this section. In the case of deep slim wells, flow testing may not be possible. Under these conditions, information gathering will be limited to stratigraphy, structures, and downhole logging (such as temperature and pressure).

Background information on the different operational phases of well testing, including airlifting, logging and data interpretation is presented in Appendix 5.

6.1 Logging at well completion

A detailed plan for logging at well completion is required, including a schedule for the logging and interpretation as well as information on instrumentation to be used. The following information is required:

¹⁶ Lower temperatures are below 220 °C; above these temperatures "flashing" can be used for testing.

- a) Proposed schedule (timing of logs, well section to be logged, staff involved and expertise)
- b) Required measurements (Temperature and pressure vs. depth)
- c) Instrumentation (logging unit, slick-line or wireline, logging tools, etc.)
- d) Interpretation (incl. feed-zone depth and first estimate of reservoir temperature and initial pressure)

The main results of this phase, including first indications of reservoir temperature and initial pressure, as well as feed-zone information, will be indirectly required for the drilling success criteria (Section 7), even though more direct information, e.g. on temperature and pressure will emerge later.

6.2 Step-rate injection testing

Short-term step-rate injection testing at the end of drilling is required. This is generally done for high-temperature wells¹⁷, however, could also be applied to low temperature well, even though airlifting is generally more common (see also Appendix 5). A detailed plan for the testing is required, including a schedule for the testing, measurements, and interpretation as well as information on instrumentation to be used. The following information is required:

- a) Proposed schedule:
 - Number and length of steps.
 - Pressure recovery (decline/loss for injection).
 - Staff involved and expertise.
- b) Required measurements:
 - Injection flowrate.
 - Well-head pressure (if any) and down-hole pressure with time.
 - Temperature and pressure logs (see a) above).
- c) Instrumentation (pumps, flow measurements, pressure sensors, logging tools, etc.).
- d) Required interpretation, as far as data allows:
 - Well injectivity.
 - Transmissivity, permeability-thickness, and skin (from pressure transient analysis).
 - Feed-zone depth and their relative contribution (optional).
 - Estimates of formation temperature (specifically at feed-zone depth).

The main results of this phase, including the estimate for injectivity as well as first indications of permeability and skin, will provide early indications relevant for the success criteria (Section 7).

6.3 Well warm-up phase

Often a specific warm-up phase after drilling is required, especially in high temperature wells. Specifying a universal length of the warm-up period is not possible due to variable well conditions, as well as constraints related to logistics and time. The reference length is about two months, while a shorter period is acceptable in some cases, especially when pumping or airlifting is planned. The preferred number of warm-up temperature logs required is four with increasing time between them. A plan for this phase is required, as before. The following information is required:

- a) Proposed schedule (length of warm-up period, number of logs, staff involved and expertise).
- b) Required measurements:
 - Temperature and pressure vs. depth.

¹⁷ For temperatures above 220 °C.

- c) Instrumentation (same as in a) above).
- d) Interpretation:
 - Formation temperature at selected depths (e.g. by Horner-method with correction).
 - Feed-zone depths and pressure pivot point, i.e. the initial reservoir pressure.

The main results of this phase are the estimated formation temperature with depth, which provides estimates of feed-zone temperature when linked with information on feed-zone depths, as well as the pivot point depth (also linked with feed-zone depths). The temperature information will provide direct input for the drilling success criteria (Section 7).

6.4 Flow, or output testing for high temperature testing

High-temperature wells are tested through spontaneous discharge driven by boiling in the wellbore, while low-temperature wells are either tested by down-hole pumps (preferable) or airlifting. A detailed plan for the testing is required, including a schedule for the testing, measurement, and interpretation as well as information on instrumentation to be used. Information on the following is required:

- a) Proposed schedule:
 - Initiation of flow; method to be used.
 - Method to be used to measure flow and/or enthalpy:
 - i. water-flow and reservoir enthalpy (liquid dominated reservoir).
 - ii. lip-pressure (Russel James) and water-flow.
 - iii. TFT measurements of liquid and steam flowrate (optional).
 - Monitoring (parameters, mode, frequency, etc.).
 - Length of test and need for variable opening (steps).
 - Logs, especially temperature and pressure.
 - Down-hole measurements with time.
 - Down-hole pressure recovery after flow-test.
 - Staff involved and expertise.
- b) Required measurements:
 - Well-head pressure.
 - Lip-pressure (critical pressure) for high temperature well (those that discharge by boiling).
 - Water height in weir-box.
 - TFT concentrations in liquid and steam (if TFT method used).
 - Down-hole pressure and temperature with time.
 - Temperature and pressure logs (see a) above), spinner log is optional.
 - Chemical and gas content (see later in this section).
- c) Instrumentation:
 - Compressor(s) and weir-box.
 - Pressure and temperature sensors.
 - TFT instrumentation (if TFT method is used).
 - Digital data logging system for recording parameters above, optional.
 - Downhole pressure sensor; either memory, wireline (if possible) or capillary tube (N₂).
 - Logging instrumentation (see a) above).
- d) Interpretation:
 - Water-flow, steam-flow, and fluid enthalpy.
 - Productivity-index, i.e. total flow per unit change in reservoir pressure.
 - Production characteristics (simple plot of flowrate vs. pressure, either well-head pressure or down-hole pressure).
 - Output capacity as total flowrate and enthalpy, or steam-flow and water-flow, at a given well-head pressure.
 - Transmissivity (permeability-thickness) and skin.

- Further improvement of formation temperature profiles and feed-zone locations.

A key element in flow-testing of high-temperature wells is the length of a test. Ideally, such a test should last long enough for the well to have reached stable flow-conditions (well-head pressure, flowrate, and enthalpy), which may often take a few weeks or up to 2-3 months. Reaching fully stable conditions may often not be realistic, so stability within the range of $\pm 15\%$ (of total changes observed during the whole testing period) in these parameters should be sufficient. If local conditions and/or local regulations and permits involved do not allow testing long enough for stable conditions to be reached, a short-term test may have to be implemented. That means that if the well has not reached stable or semi-stable conditions during the short term testing, the success or failure decisions needs to be postponed until the conditions for long enough testing has been met and a long term flow-testing has been carried out.

The main results of this key phase are firstly estimated long-term well-head pressure, enthalpy and well discharge (steam and liquid) and consequently well capacity (MW_e or MW_{th}). The capacity should be relative to a specific well-head pressure relevant for electricity generation, or over a range of well-head pressure values. This information will provide direct and essential input for the drilling success criteria (Section 7).

6.5 Chemical sampling

Applicants shall provide a detailed sampling plan addressing the following:

- Sampling locations.
- Sampling equipment.
- Sampling- and analytical methods, including sampling preservation and determination of non-condensable gases (NCG).
- Timing.

A total two-phase sample includes determination of the following components:

- Liquid phase samples: pH, conductivity, Si, Na, K, Ca, Mg, Cl, F, B, SO_4 , Fe, CO_2 , H_2S , NH_3 , Li, As and stable isotopes of oxygen and hydrogen.
- Condensate: Na (or Cl), B, NH_3 and stable isotopes of oxygen and hydrogen.
- Steam phase: CO_2 , H_2S , O_2 , N_2 , CH_4 and Ar.

Samples collected from single-phase wells shall include the liquid phase components listed above.

As previously addressed, the CO_2 emission from wells supported by the RSM shall not exceed 555 g/kWh. CO_2 concentrations shall be determined when a flowing well has reached stability according to definition in Section 6.4 above.

6.6 Special provisions for low to medium temperature and slim wells

Some flexibility regarding logging and testing is associated with the requirements listed above in the case of low-temperature wells (see Section 7) and deep slim-holes (> 1000 m). This is summarized in Table 13 below. This applies e.g. to discharge testing of low-temperature wells where the main required output parameters are flowrate, water temperature and pressure (water-level) draw-down instead of flowrate, enthalpy, and well-head pressure. Different success criteria will therefore apply in such situations. Some additional flexibility may also apply depending on local conditions and well characteristics.

Table 13 – Summary of steps in well testing protocol

Phase	Low-temperature wells	Deep slim holes
A. Logging at completion	Usually comparable to high Temperature wells, but may be scaled down	Usually just P and T logging
B. Step-rate testing	Often airlift testing	Usually no testing
C. Stimulation	Same requirement	Not required
D. Warm-up	A shorter warm-up period may be acceptable + fewer T-logs; final warm-up during discharge testing	A shorter warm-up period usually required, and the use of Horner Plot Modelling can be used to predict the formation temperatures.
E. Discharge testing	Down-hole pump (preferred), airlifting or artesian flow <u>Key parameters:</u> Flowrate, temperature, pressure, or water-level drawdown	Usually no discharge testing

7 Success criteria

As discussed in Section 3 on BP evaluation, the success criteria (SC) for the exploration wells drilled under RSM coverage will be based on the BP for the development of the geothermal resource. In short, the SC in terms of well output¹⁸ is to be defined as equal to or greater than the minimum average well output for the project to be economically viable (break even at an IRR of 8%). The formulas for calculations of SC, against which success will be measured, is described in Appendix 7. During evaluation of applications and prior to signing of the BA, the RSM Unit will scrutinize the assumptions in the financial model, from which the minimum viable well output is derived. If the RSM does not find the financial modelling assumptions acceptable, the RSM and the Beneficiary will enter into negotiations in order to agree upon the model inputs and the resulting minimum average output for wells drilled under the project. The agreed output values will be recorded as the SC in the BA (Figure 7).

¹⁸ This applies to wells that are drilled to assess reservoir productivity, i.e. can be flow tested, either two-phase or one-phase flow wells. Note that the RSM also allows risk sharing for holes drilled for the purpose of confirming temperature at a specific depth. For temperature confirmation holes the success criteria will need to be defined based on an agreement between the Beneficiary and the RSM on what temperature can "reasonably" be expected at a given depth based on the available exploration data.

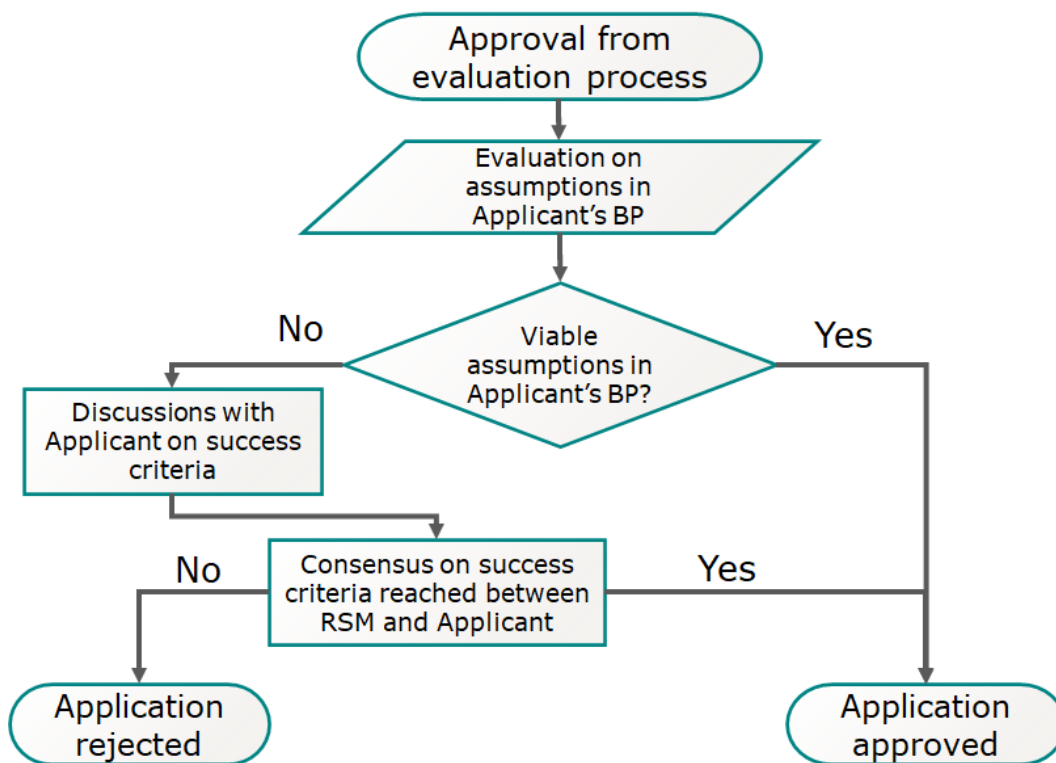


Figure 7 – Flowchart to clarify how success criteria will be determined between RSM Unit and Applicant

The SC will be kept as simple as possible and will be expressed in the following parameters and their threshold values (minimum) in terms of the business model:

- Installed gross capacity in MW_e for a power plant and MW_{th} for direct use application.
- Only temperature at specific depth for slim holes

As noted in Section 1, exploration wells that can be drilled with coverage from the RSM fall into three main categories, each of them to be subject to their own distinct success criteria, see Table 14.

Table 14 – Success parameters for applicable drilling scenarios

Scenario 1: Well drilled to explore productivity and fluid enthalpy where two-phase flow is expected	Scenario 2: Wells drilled to explore productivity and fluid enthalpy where single-phase flow is expected	Scenario 3: Wells drilled to confirm temperature
<ul style="list-style-type: none"> • Power output in terms of mass flow and discharge enthalpy • At minimum discharge enthalpy • At minimum well head pressure • At or below the agreed well depth and within the acceptable deviations stated in the drilling program (if well is directional) 	<ul style="list-style-type: none"> • Power output in terms of mass flow and discharge enthalpy • At minimum discharge enthalpy • At maximum drawdown • At or below the agreed well depth and within the acceptable deviations stated in the drilling program (if well is directional) 	<ul style="list-style-type: none"> • Temperature • At, or below the agreed well depth and within the acceptable deviations stated in the drilling program

The SC for wells in Scenarios 1 and 2 will be constrained by the financial analysis of the BP. **The minimum power output for a well to be defined as successful will be equal to the minimum average well output for the project for the BP to be economically viable as defined in the Beneficiary's BP. In other words, the SC should mark the minimum well output, where the project is no longer profitable.**

Well testing will be done in accordance with a pre-agreed plan, between the Beneficiary and the RSM Unit, based on description of the flow test procedure in Section 6. The Beneficiary and the RSM Unit shall reach an agreement on the continuation of the flow test once semi-stable conditions during flow testing have been reached in order to assess the likely long-term output of the well. Moreover, the Beneficiary and the RSM Unit must agree on the likely thermal recovery time of each well before initiating flow test or if flow should be initiated before full thermal recovery has been reached. If flow from a well will not be initiated by airlifting or pumping shortly after the well has been drilled, the thermal recovery of the well shall be monitored as addressed in Section 6. An airlift- or pump test is required, if SC is not reached by artesian flow, to evaluate if sustainable long-term flow is likely to be reached using production pumps. If SC is reached in such way, the well is deemed successful.

In the case where the SC do not consider well output (scenario 3), for exploration wells drilled mainly for conformation of reservoir temperature at depth, the criteria will be based on temperature at depth. Wells drilled for that purpose, should be allowed to recover thermally for at least 2-3 weeks. During the recovery period, downhole temperature shall be monitored regularly (at least 3-4 times) to allow evaluation of formation temperature by applying Horner Plot modelling or similar temperature estimations. If that does not suffice to determine reliably success or failure, full thermal recovery of the well will be needed.

If any dispute remains between the RSM Unit and the Beneficiary on the results of the flow test, the RSM Unit reserves the right to request a third party evaluation and/or flow test the well again before declaring success or failure for a given well. The cost of the third-party evaluation/flow test will be borne by the RSM.

The success for each well will be determined based on comparison between the measured well output and the success criteria stipulated in the BA (Figure 8).

Well drilling failure, which can be linked to technical problems during drilling rather than geological settings and resource characteristics, will not be considered as a failure that will trigger the RSM reimbursement. It is expected that the Beneficiaries make their own arrangements (such as insurance) regarding reimbursement for technical failures of drilling that renders the well unsuccessful. This includes failure to reach the set-out drilling target or technical failures that result in an unfinished well.

An additional criterion is raised, which is based on the requirements from CTF, that the estimated CO₂ emissions during operation shall not exceed a threshold value of 555 g/kWh. In the case where only short-term flow-testing (couple of days) indicates that the well will have a CO₂ emission factor in excess of the threshold value, it has to be estimated how likely it is that such results are representative for the long-term emissions. It is known that CO₂ output can be very high initially, but often decreases rapidly thereafter. Therefore, initial CO₂ estimates from short-term flow-testing (< 5 days) should be considered provisionally, until a long-term flow-testing (as stipulated in Section 6) is possible. This can mean that even though the criterium of less than 555 g/kWh is not met in the first well to be flow-tested, the program may proceed until the

first well can be long term flow-tested for a more accurate estimation of long-term CO₂ emission. The Beneficiary may proceed to drill the next well, even if the long-term flow-testing of the first well has not been finished. He will need to provide a bank guarantee for the success fee for the next well to be drilled after which the Beneficiary will proceed at his own risk. This means that the termination of the BA will be retroactive (to the point in time that the well in question was completed) if the results from long-term flow test show an emission above 555 g/kWh of CO₂ (i.e., the second well will not be covered by RSM if it is a failed well).

A well measured with CO₂ emissions higher than 555 g/kWh will terminate the BA and will not trigger pay-out under the RSM,¹⁹ unless the well is considered unsuccessful based on the set success criteria in the BA (see Figure 9).

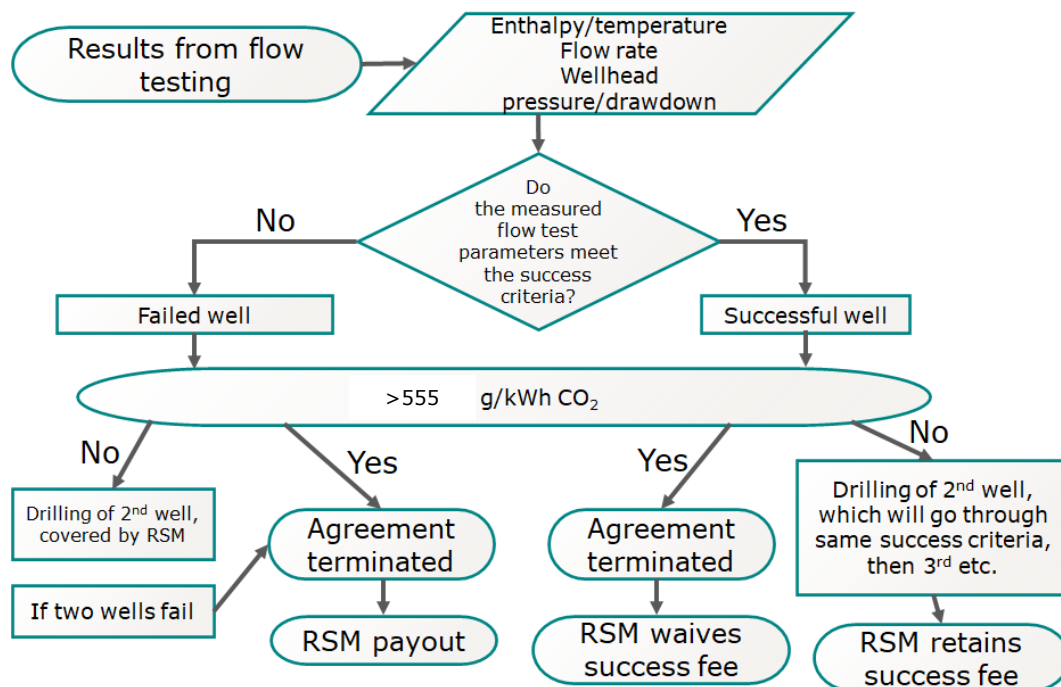


Figure 8 – Flowchart clarifying how determination on success/failure will be evaluated by the RSM Unit

8 Monitoring and reporting

The objectives of the RSM Program monitoring and evaluation activities performed by the RSM Unit and the RSM Consultant are as follows:

- Provide regular information on progress under the terms of the BA toward achieving planned results and facilitating reporting to the RSM Unit.
- Alert the RSM Unit to actual or potential problems in implementation of the project so that adjustments and required measures can be made.

The Beneficiary will allow the RSM Consultant to closely monitor their activities. This will include three main components, namely site visits, reporting, well data and financial information.

¹⁹ Moreover, the success fee will also not be taken by the RSM and the well may be used for any purpose the Beneficiary would seem fit.

- i. *Site visits:* Carried out intermittently during drilling and during all or some well tests. The objective of the site visits is to monitor the progress during drilling, verify that costs incurred correspond to activities on site and observe the well testing in order to ascertain the fulfilment of the conditions and stipulations of the BA. The Beneficiary will allow the RSM Consultant to plan for such site visits on behalf of the RSM Unit.
- ii. *Reporting:* The Beneficiary will submit the following reports:
 - Daily drilling reports.
 - Daily mudlogging/onsite geological reports.
 - Well completion reports.
 - Well testing reports in which the performance of the well is measured against the success criteria.
 - Any other reports, as stipulated in the drilling program and flow testing procedures.
 - Quarterly monitoring reports to RSM Unit where all technical, environmental and social issues will be reviewed, monitored and supervised by the RSM Unit in close coordination and support with the RSM Consultant. Monitoring will include progress on the implementation of Environmental and Social Management Plans and its relevant sub-management plans, any environmental and social issues including project-level grievances (both community or employee as well as any occupational health and safety incidents, environmental spills, near misses, as well as any progress related to land acquisition if any, etc.).
 - Report on any significant environmental or social incidents (e.g., fatalities, lost time incidents, environmental spills, etc.) will be reported to RSM Unit within 3 business days. RSM Unit will submit an incident report to the Bank, including a Root Cause Analysis (RCA), precautions and compensation measures taken within 30 business days.

The daily drilling reports and mud logging/onsite geological reports will be sent directly to the contacts assigned by the RSM Unit as well as the RSM Consultant but the RSM Consultant shall notify RSM Unit in case the drilling activity deviates from the drilling plan.

The RSM Unit supported with the RSM Consultant shall evaluate the validity of any claims presented in the well testing report by the Beneficiary.

- iii. *Well data and financial information:* Throughout the drilling and testing period the Beneficiary will share financial and technical data with the RSM Unit and RSM Consultant as specified in the RSM BA.

The Beneficiary will be obligated to submit invoices and proof of payment to the RSM Unit as expenses are incurred in the exploration drilling projects. The RSM Unit shall receive and verify this information.

The data shall be submitted in a standardized format as defined by the RSM Unit.

9 Information and communication

Information on the RSM will be disclosed and disseminated publicly, including governments, civil society organizations and the private sector, unless there is a compelling reason not to do so. For this reason, an RSM website has been established:

www.rpmjeoturkiye.com and www.rsmgeoturkey.com

All relevant information on the RSM are published on these websites.

After signing the BA in each application round, information on the total number of projects funded and the total amount of funds will be published on the webpage, including the list of Beneficiaries and project locations.

Project data including information on the developer, the location, size and nature of resource; type and number of drillings and metadata on information sources will also be published in the RSM website unless the Beneficiary can justify that publishing the material will be detrimental to the right of the Beneficiary. In the case of non-acceptance, the information will still be stored in the database (see below) with access only for the RSM Unit, Beneficiary and other entities accepted and/or requested by the Beneficiary.

As part of the RSM, a database will be created (RSM Database) which will store all available information provided by the Beneficiary as well as data from wells drilled with support from the RSM within specific project sites.

Beneficiaries will need to provide the specified information to feed into the RSM database according to pre-established templates. The database will make use of GIS techniques and use layers for different information and allow for reporting and analysis. The database will also include project information data, as well as progress and any issues that need to be tracked and reported regarding the project progress. The data to be included in the database comprise at least the following:

- a. Coordinates of well head
- b. Well track in x, y, and z [including final survey data (TVD, MD, azimuth, inclination, and horizontal displacement, etc.) if the well is directional]
- c. Final well design (as is) (including casing depth, casing shoe depth, casing type and grade, etc.)
- d. Wellhead assembly (including master valve, expansion spool and other valves information; diameter, grade, etc.)
- e. Lithological column
- f. Stratigraphy information
- g. Starting depth of the basement unit
- h. Important mud losses within the basement unit
- i. Rock alteration
- j. Well logs (such as temperature, pressure, etc.) collected during and after drilling
- k. Information about feeding aquifers
- l. Chemical analysis of fluid samples (including sampling and analysis date, laboratory information, major anions and cations etc.)
- m. Completion test data and test parameters
- n. Discharge test data and test parameters
- o. Land use maps
- p. Geological layers
- q. Project information/progress layers and other data requested from the tests and inspections.
- r. Geophysical data if available (gravity, MT, VES, seismic, etc.)
- s. Fault map (surface fault, probable or exact faults within the project license area)
- t. Daily drilling, geology, mud and HSE records for each well. Under HSE, social/community engagement aspects will be included, namely the number of community meetings held, grievance system in place and number of grievances recorded, etc.
- u. Baseline information on project affected lands and people including records to land use arrangements (rental agreements/acquisition records).

The database will have restricted access. No information on specific projects will be made accessible or distributed to the public nor to other Beneficiaries, unless with a written and signed permission from the Beneficiary.

The RSM Unit, however, does not need special permission to use the information for statistical analysis on the RSM program which may be published; as long as the information remains secured, and will not be linked to a specific project.

10 Standard legal agreement between RSM and Beneficiary

For an RSM project to take effect, an agreement between the Beneficiary and the RSM Unit must be fully approved and signed by the Parties. The Beneficiary and the RSM Unit must reach a consensus on the SC as stipulated in Section 6. The SC will be included in the BA and will serve as the basis for deciding upon success or failure of the wells after being flow tested.

The draft BA between the RSM Unit and Beneficiary is presented in Appendix 8.

11 Compliance of Turkish EIA Regulation with WB requirements

Geothermal exploration drilling and testing has temporary local adverse impact on the environment. In addition to that, access roads and well pads may have long-term negative visual impacts. For this reason, geothermal exploration drilling and well testing is subject to the Turkish Environmental Impact Assessment (EIA) Regulation. Geothermal exploration drilling projects are treated as Annex II projects in the Turkish EIA regulation (Official Gazette No. 29186, November 25, 2014) within the scope of "*Mine, petroleum and geothermal resource exploration projects (Excluding searches made by seismic, electric, magnetic, electromagnetic, geophysical, etc. methods)*". Annex II projects are projects that may or may not have significant effects on the environment. Preparation of Project Information File (PIF) is required for Annex II projects, which contains information on:

- (i) project characteristics,
- (ii) project site and existing environmental characteristics of the impact area, and
- (iii) significant environmental impacts of the project during construction and operation phases and measures to be taken.

The PIF shall be submitted to the Provincial Directorates of Environment and Urbanization (PDEU) before exploration application. The Governorship reviews the PIF prepared for the project within 5 working days. In case there are deficiencies in the information and documents within the scope of the PIF, the institutions/organizations authorized/certified by the MEUCC are requested to complete them. PIFs whose deficiencies are not submitted to the Governorship within 6 months are returned, the application is deemed invalid. If deemed necessary, the Governorship may inspect the project area on site or have it examined. The Governorship completes its examinations and evaluations within 15 working days. It makes the decision of "EIA Required" or "EIA Not Required" about the project within 5 working days and notifies the project owner and the institutions/organizations authorized/certified by the MEUCC. The Governorship

announces this decision to the public via suspended announcement and the internet. The EIA method is applied to the projects for which "EIA Required" decision is made.

The EIA process includes following main steps:

- EIA application file is submitted to the MEUCC,
- Public Participation Meeting is conducted,
- Project Specific Format for EIA Report is issued by the MEUCC,
- EIA Report is submitted to the MEUCC,
- EIA Report is examined by the MEUCC,
- "EIA is Positive" or "EIA is Negative" decision is made.

The EIA application file is prepared according to the general format provided in Annex-3 of the EIA Regulation and submitted to the MEUCC by the institutions/organizations authorized/certified by the MEUCC. The MEUCC examines the EIA application file within 5 working days. If the file is found in compliance with the general format, an examination and evaluation Commission is formed with the participation of representatives of relevant governmental institutions/organizations, the MEUCC, project owner and the institutions/organizations authorized/certified by the MEUCC. The Governorate and the MEUCC announce the initiation of EIA process to the public via loudspeaker announcement, bulletin board, internet, etc. A "public participation meeting" chaired by the MEUCC provincial director in a location that affected local groups can access easily is held. The invitation to the meeting is published in a national and a local newspaper at least 10 calendar days prior to the meeting. Based on the opinion and suggestions of the Commission members and the public, a project specific format for the EIA Report to be prepared is issued by MEUCC. The EIA Report to be prepared in line with the format provided should be submitted to the MEUCC within 12 months, otherwise, the EIA process is terminated.

After the submission of the EIA Report, the MEUCC examines the compliance of the report with the project specific format issued within 5 working days. If found in compliance with the format, MEUCC invites the Commission members to the examination and evaluation meeting and sends the EIA Report. The Governorate and the MEUCC announce to the public the initiation of examination and evaluation process, and that the EIA report is made available for public comments. Public opinion could be provided until the EIA Report is finalized. The Commission examines and evaluates the EIA Report within 10 working days after the first commission meeting. The EIA Report, which was examined and finalized by the examination and evaluation commission, is submitted to the MEUCC by the institutions/organizations authorized/certified by the MEUCC within 10 calendar days after the examination and evaluation meetings are terminated. The final form of the EIA Report is made available for public opinion and suggestion for 10 calendar days by the MEUCC and/or the Governorate via suspended announcement and the internet. In line with the opinions of the public, the MEUCC may request the completion of the necessary deficiencies in the report content, additional studies, or the re-assembly of the Commission. The MEUCC makes the decision of "EIA Positive" or "EIA Negative" for the project within ten 10 working days, considering the work of the Commission on the report and the opinions of the public. "EIA Positive" or "EIA Negative" decision given for the project is announced to the public by the MEUCC and the Governorship via suspended announcement and on the internet.

Regarding projects for which "EIA Positive" decision or "EIA Not Required" decision has been made, the MEUCC monitors and controls the projects based on the commitments stated in the EIA Report and PIF. If there is any update regarding a project within the

scope of EIA Regulation, investor is required to inform MEUCC and relevant Provincial Directorate.

WB classifies three categories, depending on the type, location, sensitivity, scale of the project, the nature, and the magnitude of the potential environmental impacts. In most cases, geothermal exploration drilling and testing is expected to be classified in Category B projects according to Operational Policy (OP) 4.01. According to OP 4.01, a proposed project is classified as Category B project if its potential adverse environmental and social impacts on human populations or environmentally important areas are site specific, if only few of them are irreversible and mitigation measures can be designed readily. Although environmental impacts of Category B projects are expected to be less than in Category A projects, environmental assessment of Category B projects examines the project's potential negative and positive impacts and recommends measures needed to prevent, minimize, mitigate or compensate for adverse impacts. For Category B projects, the environmental and social impacts can be assessed through an Environmental and Social Management Plan (ESMP), Resettlement Action Plan (RAP), Abbreviated RAP (ARAP) or an Ex-Post Social Audit (where applicable). An ESMP consists of set of mitigation, monitoring and institutional measures to be taken during construction, drilling, and testing to eliminate adverse environmental and social impacts, offset them or reduce them to acceptable levels. General contents of an ESMP are presented in Annex 10B. Templates for mitigation plans are presented in Appendix 9, Environmental and Social Management Framework. Templates for Environmental and Social Monitoring Plans are found in Annex 10A. The ARAP outlines potential land-based impacts and mitigation measures for future land take requirements that the beneficiaries will follow under the circumstances where no willing buyer transactions can be realized. In cases where land rental or acquisition has already taken place, an Ex-Post Social Audit will showcase whether previous land use permits, or acquisitions have been carried out according to Bank policies. Templates for both documents are presented under Annex 10F, 12G and 12H respectively.

Turkish EIA procedures are, with some exceptions, in line with the environmental consideration of the WB's Policies. The main exceptions are in project categorization, content of EA and public consultation and social assessments including land expropriation process. These key differences are discussed in the ESMF (Appendix 9). Due to the similarities of procedures to be carried out to fulfil WB's OP 4.01 requirements and the Turkish EIA process, the ESMF lays out a step-by step procedure to meet WB's requirements. This procedure is supplementary to the Turkish EIA process that should already be carried out. This process is shown in Figure 9.

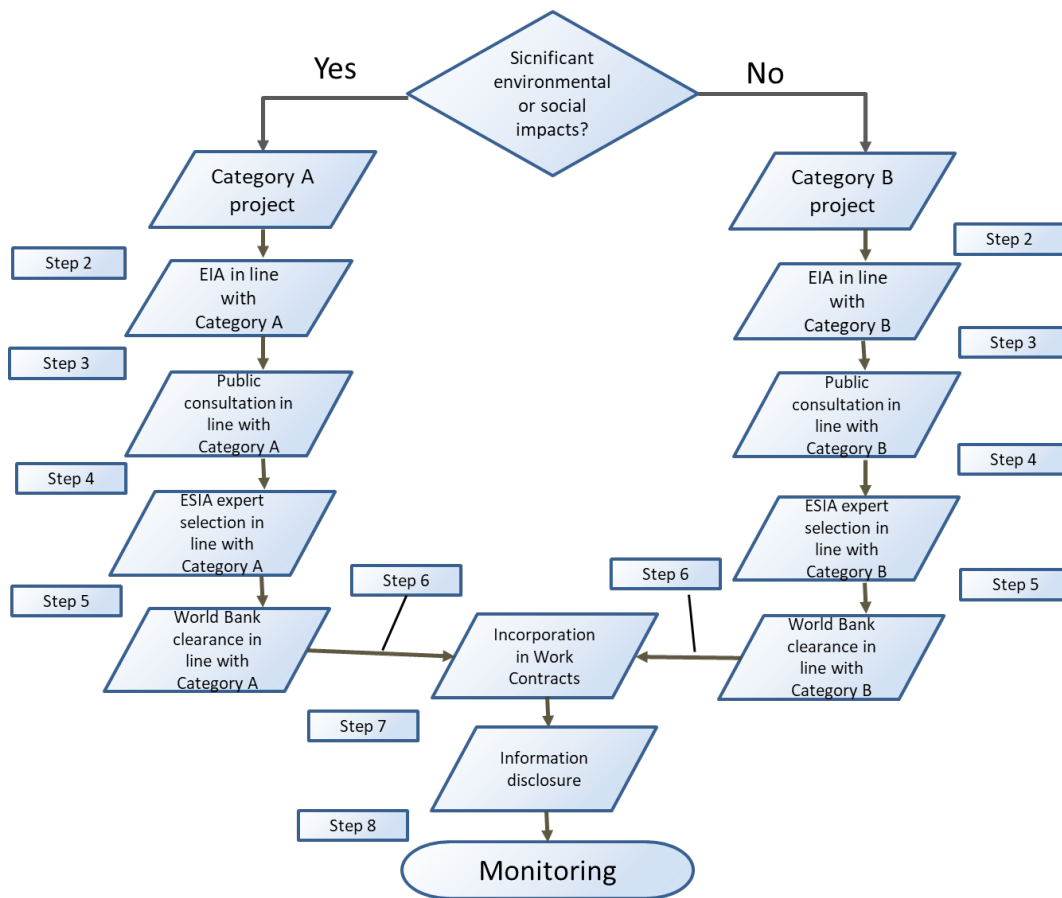


Figure 9 – Step-by-step process in meeting WB environmental requirements. This process is discussed in detail in Appendix 9, Environmental and Social Management Framework.

On the other hand, within the scope of Cumulative Impact Assessment (CIA) Report developed for Türkiye geothermal resources, some amendments have been proposed for EIA Regulation by considering international standards, legislation, guidelines, and good practices. It is expected that these recommendations will be taken into consideration by relevant authorities and official process will be completed for the amendments. During EIA process, lessons learnt from Round 1 listed below have been also considered:

- As time-saving solution for start-up of exploration projects develop PIFs as comprehensive as EIA Reports and implement in this respect.
- Within the scope of national environmental impact assessments, conduct risk mapping for project based on available information (EBRD, MEUCC) for cumulative environmental and social impacts and stakeholder meetings.
- Collect project detailed feedbacks during development of SEP at the beginning of project.
- Develop EIA Report if the project has critical risks.
- Continue SEP and grievance mechanism implementation actively with appropriate personnel.
- Take orientation and refresher trainings for WB safeguard policies.
- Ensure that consultants hired for the project interact with TKYB Environmental and Social Consultants throughout the process.
- Ensure that critical path studies are conducted in good timeframe.

An ESMF sets a technical guidance in handling and organizing environmental and social assessment and management for projects whose specific characteristics (e.g., dimensions, designs) are yet to be defined. The summary of the ESMF presenting the principles for environmental and social management of the RSM project is presented in Appendix 9. The ESMF presents the necessary compliance requirements for prospective investments to achieve approval of national laws and provisions of the WB's OP 4.01 and OP 4.04. Furthermore, the ESMF addresses the key differences between the Turkish regulation and WB requirements.

Environmental and social safeguard screening according to a screening checklist in Annex 10A is required for each proposed project to determine the appropriate extent and type of environmental assessment.

A Stakeholder Engagement Plan (SEP) shall be prepared by Applicants (see SEP template provided in Annex 12B). Public consultations shall be widely announced at least two weeks in advance using local newspapers and other local means of information dissemination that are known to be effective. For both Category A and B projects, the developer will ensure that draft ESIA's and ESMPs and other assessment or supplementary documents are available in public places and meeting announcement will point out the location. The minutes of public meetings will be recorded and included in the ESIA/ESMPs (Category A, Category B, respectively) of subprojects.

During these meetings, local people shall be informed about the methodology of land acquisition (expropriation, urgent expropriation, willing buyer – willing seller procedures, etc.). Moreover, the overall methodology of the land acquisition methods, the timeframe assumed for this phase and the contact point from Applicant's side shall be presented.

Land acquisition/expropriation in the Turkish legal framework is based on the Expropriation Law No. 2942. Resettlement is regulated by the Resettlement Law No. 5543. The contents of these Laws are discussed in detail and compared to WB's Operational Policy on involuntary resettlement (OP 4.12) in Appendix 11, Resettlement Policy Framework that has been prepared for the project.

The ESMP prepared for the project should initially indicate the land related impacts of the relevant project components. If the land is already rented or acquired by the applicant, the ESMP will provide update information on land take actions up to date. In such cases, a complimentary Ex-Post Social Audit will be prepared by the applicant to showcase how the land is acquired/rented. If the lands have not yet been acquired or rented for use during ESMP preparation, then the report should indicate how the applicant plans to acquire land for exploration purposes. If the applicant has i) not obtained a public interest decision and ii) plans to acquire land through a willing buyer/seller transaction, then no RAP/ARAP will need to be prepared. However, if there is a need to expropriate the land through application of law; the applicant will be requested to prepare a RAP/ARAP. In cases where the applicant plans to rent the land, rental agreements and the consent of the landowner/user will need to be submitted as justification.

Beneficiaries are required to ensure occupational health and safety in all projects by implementing Occupational Health and Safety Plan. Zero accident policy should be main vision of the Occupational Health and Safety Plans. General contents of an Occupational Health and Safety Plan is presented in Annex 10E.

OP 4.12 points out that involuntary resettlement may cause severe long-term hardship, impoverishment, and environmental damage, unless appropriate measures are planned and carried out. Thus, as a mitigation plan, Resettlement Action Plan (RAP) or

Abbreviated RAP (ARAP) shall be prepared where involuntary resettlement or expropriation is foreseen and where there is no will buyer seller arrangement. Guidelines for preparation of RAP/ARAP are presented in Annexes 10F/12G. Where the beneficiaries have already acquired land or obtained the use rights, an Ex-Post Audit will be prepared to justify the actions have taken place in line with project RPF and OP 4.12.

A list of WB Operation Policies triggered in exploration drilling projects are listed in Table 15. The same table lists safeguard documents that may be required, depending on the environmental and social safeguard screening (Annex 10A).

Table 15 – Overview of WB Operation Policies triggered in exploration drilling projects and overview of safeguard documents that may have to be prepared for each project depending on the foreseen impact. All the required Safeguard Documents shall be prepared in Step 2 as a part of either ESIA or ESMP.

WB Operation Policies triggered
OP 4.01 Environmental Assessment
OP 4.04 Natural Habitat
OP 4.11 Physical Cultural Resources
OP 4.12 Involuntary Resettlement
OP 4.36 Forest
Applicable Safeguards Documents²⁰
Screening Checklist for Environmental and Social Safeguards (Annex 10A)
Environmental and Social Impact Assessment (ESIA), Category A in accordance with WB OP 4.01
Environmental and Social Management Plan (ESMP), Category B in accordance with WB OP 4.01 and Annex 10B
Stakeholder Engagement Plan (Annex 10C)
Cultural Heritage Management Plan (including Change Find Procedure) (Annex 10D)
Occupational Health and Safety Management Plan (including Emergency Response Plan) (Annex 10E)
Resettlement Action Plan (Annex 10F)
Traffic Management Plan (Annex 10G)
Waste Management Plan (Annex 10H)
Effluent Management Plan (Annex 10I)
Hazardous Material Management Plan (Annex 10J)
Community Health and Safety Management Plan (Annex 10K)

²⁰ This is a representative documentation list. Final list of documents would be clarified on case-by-case basis. It would be ensured that all applicable documents shall be developed.

Appendix 1. List of required permits, licenses, and rights

For a firm to qualify for coverage under the RSM Program, a valid **exploration license** is required. This license should be valid until the end of the drilling program; however, a license that remains valid for 18 months from the application date will be accepted. The 18-month duration also includes the time necessary for the license holder to extend the exploration license by an additional year. Less than 18 months of remaining validity on the license may be acceptable in cases for which the drilling program can be completed in a shorter period.

A geothermal firm which has been active in Türkiye, which has undertaken exploration activities in the past and that holds an **operation license** (i.e., for direct use of geothermal hot water in greenhouses) will generally be allowed to participate in the RSM Program for these additional exploration activities.

Requirements for a geothermal exploration and operation license:

- 1/25000 Scale Sheet and Coordinates.
- Application form.
- ANNEX-2 for Real Persons ANNEX-3 for legal entity²¹;
- First Application's letter of undertaking
- Exploration Project
- T. C. Identification number. Including Identification Card.
- The relevant Tax Office, province, and Tax number.
- Contact information.
- Bank name and Account number.
- Approved Signature Circulars.
- Company Registration Status & Trade Registry Gazette showing latest registry.
- Approved Signature Circulars of the Company's Management.
- License Fee (Fee for 2014: 1,632.50 TL).
- License Coverage (minimum guarantee amount for 2014: 24,487.80 TL).
- Documents will be confirmed as "original" after being seen by administrator.

In addition to the right to explore for geothermal resources, additional licenses and permits will be required for successfully undertaking exploration activities including:

- Resolution of any land ownership issues affecting the exploration area. The Beneficiary will have to identify the property holder of the land on which the search activities will be done. The Beneficiary will be required to present an agreement with the landowner, or expropriation plan, in case the Beneficiary does not own the land. This should clearly demonstrate that expropriation will not be a barrier against exploration activities in the licensed area.
- For each drilling location, an EIA application must be performed and a certificate indicating that an "EIA positive" or "EIA not required" decision must be granted.²²
- Land use permits will be required for agricultural, pasture and forest lands.
- Expected temporary storage and disposals of brine will need to be planned for prior to drilling. Disposal permits must be obtained from local Governors.
- A water extraction permit will be required for obtaining the right to use the water which is anticipated to be found at the geothermal source.
- In case equipment will be imported, an import license will be required.

²¹ See <http://www.mevzuat.gov.tr/MevzuatMetin/yonetmelik/7.5.11767%20ekler.doc>

²² In case a full EIA will be required, this process also needs to be completed prior to signing the BA.

Appendix 2. Surface exploration studies

There is a suite of surface exploration studies that are essential for the initial evaluation to determine if there is a potential geothermal resource within the study area and whether its development is feasible.

Exploration methods and exploration data that will be considered when applications are evaluated are listed below. Note that the applicability of different exploration methods depends on the nature of the proposed reservoir. It is not required that all of this information and data is provided, but this serves more as a list of data that may be useful if available.

There is a difference in the approach between a relatively shallow, low temperature resources for direct use and deeper, intermediate to high temperature resources for power generation.

As a guideline, some minimum information will be needed to evaluate the likelihood of a geothermal resource being present.

For shallow, low temperature resource for direct use the following can be considered as minimum information collection:

- Structural and Geothermal Mapping
- Geochemical Study & Analysis
- Geological Studies (Soil / Gas / Hydrogeology)

For deeper, intermediate to high temperature resources for power generation, the following is considered a minimum:

- Structural and Geothermal Mapping
- Geochemical Study & Analysis
- Geological Studies (Soil / Gas / Hydrogeology)
- Resistivity Study Over Large Area
- Gravity Study

More information may be needed if these studies are not considered sufficiently decisive. During evaluation of applications, missing or limited data will be highlighted through the scoring system. Feedback will be sent to all applicants when evaluation is completed.

Below is a list of type data and information that is useful for geothermal exploration and development and that might be deemed necessary on case-by-case basis.

1. **Infrastructure and local topography**

- a. Infrastructure maps (roads, licensing area, wells, power lines and other relevant infrastructure)
- b. Topographic maps

2. **Geological exploration:**

- a. Geological maps, scale, year of acquisition
- b. Structural maps, scale, year of acquisition
- c. Maps of geothermal surface manifestations, active and fossil, infra-red images
- d. Soil gas flux, soil temperature
- e. Hydrogeological studies and mapping, scale, year of acquisition

- f. Remote sensing techniques (aerial photographs, satellite imaging, etc.)
- g. Whole Rock samples chemical analysis
- h. Age determination of rocks
- i. Other studies

3. Geophysical exploration

- a. Resistivity survey
- b. MT, year of acquisition
 - i. TEM, year of acquisition
 - ii. CSAMT, year of acquisition
 - iii. Other resistivity methods, year of acquisition
- c. Processing of resistivity data
 - i. 1D inversion, year of processing
 - ii. 2D inversion, year of processing
 - iii. 3D inversion, year of processing
- d. 2D and/or 3D seismic survey, year of acquisition and processing
- e. Macro and/or Micro seismic measurements, year of acquisition and processing
 - i. Epicenters
 - ii. Tomography
- f. Magnetic measurements, type, year of acquisition and processing
- g. Gravity measurements, year of acquisition and processing
 - i. Regional gravity
 - ii. Micro gravity

4. Geochemical exploration

- a. Geochemical sampling map, scale, year of acquisition
- b. Temperature and estimated flow from surface manifestations
- c. Geochemical analysis from manifestations, type of analysis, year of acquisition
- d. Results from geothermometers
- e. Results from mixing model calculations

5. Exploration wells and other wells in the area (if any exists)

- a. Map of wells in the area, including type of wells
- b. List of wells in the area, including
 - i. Type (exploration, gradient, water wells, oil wells, etc.)
 - ii. Depth
 - iii. Temperature profiles
 - iv. Maximum temperature
 - v. Depth to aquifers
 - vi. Inflow temperature at aquifers
 - vii. Outflow and temperature
 - viii. Water level or shut-in pressure
- c. Well design and drilling program (if available)
 - i. Well drawing as planned
 - ii. Drilling program as planned
 - iii. Well drawing "as built"
 - iv. Information on deviation from design and drilling program
 - v. Total cost of drilling, including infrastructure and flow testing
- d. Information from wells during drilling (if available)

- i. Drilling reports, including drilling progress plots and drilling data
 - ii. Lithology and hydrothermal alteration
 - iii. Geophysical well logging information during drilling (P, T, Spinner, NN, Gamma, resistivity, etc.).
 - iv. Circulation losses
 - v. Injection testing, determining injectivity of well
- e. Information on flow testing of exploration wells (if available)
 - i. Type of flow testing (flashing, airlifting, pumping, artesian)
 - ii. Duration of flow testing (short term – long term)
 - iii. Information on surface installations for flow testing (separator, LIP, weir box, throttling, etc.)
 - iv. Flow rates encountered and associated gathering of well head and downhole data (P, T, and enthalpy)
 - v. Sampling of geothermal fluids during flow testing and analyses
 - vi. Chemical composition of geothermal brine and steam
 - vii. Analysis of steam and gas fractions
 - viii. Results from flow testing in terms of MW_e through applicable power conversion technique
 - ix. Indications of long-term behavior and sustainability

6. **Conceptual models**

- a. Conceptual models should address the following:
 - i. Likely reservoir temperature(s)
 - ii. Likely size and thickness of the reservoir
 - iii. Geological conditions
 - iv. Boundaries and boundary conditions
 - v. Hydrogeology and recharge
 - vi. Likely chemistry of fluids (including CO₂ concentrations)
 - vii. Maps and cross sections (showing the components listed above and temperature isotherms)

7. **Geothermal resource assessment**

- a. All data combined, and geothermal conceptual model presented, indicating:
 - i. Likely areal size and thickness of reservoir
 - ii. Likely reservoir temperatures
 - iii. Likely chemical composition of geothermal liquid
- b. Volumetric assessment, taking all surface- and subsurface data into account

All other information that might be relevant to a specific area and not mentioned in the above list will be considered in assessment of the geothermal potential of the area.

In addition to the interpretation of the results of any previous works as described above, an assessment of the underlying geothermal raw data may be required by the RSM Unit. On a case-by-case basis, the RSM Unit may request specific raw data for re-interpretation and analysis to verify the conceptual model and the interpretation of the results provided by the Applicant.

Appendix 3. Conceptual models and resource assessment

The assessment of geothermal resources involves studies and research aimed at assessing the nature and energy production capacity of geothermal systems. It is based on the data available at any given time, or stage, in the development of a system.

When carrying out conceptual modelling and resource assessment, the following references may be useful:

- Geothermal Exploration Best Practices: A Guide to Resource Data Collection, Analysis, and Presentation for Geothermal Projects, by IFC-IGA, 2013 (https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_geothermal-bp)

The IFC-IGA Guide is of particular importance in the coordination of conceptual model development while the Australian Code is helpful in the classification of resources in terms of knowledge and probability.

CONCEPTUAL MODEL DEVELOPMENT

During the exploration phase, a conceptual model of the geothermal resource should be prepared. This model should be consequently updated and refined, as more data is gathered, such as surface exploration data, well data as well as testing and monitoring data. A conceptual model is a representation of the best understanding of a geothermal system at any time, consistent with all known data and interpretation. The model needs to contain sufficient geological and tectonic information to allow a first pass estimate of resource distribution, temperature, and size. Conceptual models are used to target deep wells toward lithological units and/or structures with the highest probability of delivering geothermal fluids. Conceptual models also provide the basis of resource assessments, whether they are simple volumetric assessments or complex numerical models. While it is expected that the initial conceptual model may be crude or incomplete, it is important to have an initial model that can be refined and improved as drilling proceeds and more data becomes available (IFC-IGA, 2013). A conceptual model is either visualized as 2D cross sections, or simple or complicated 3D models (see Figure 10 below).

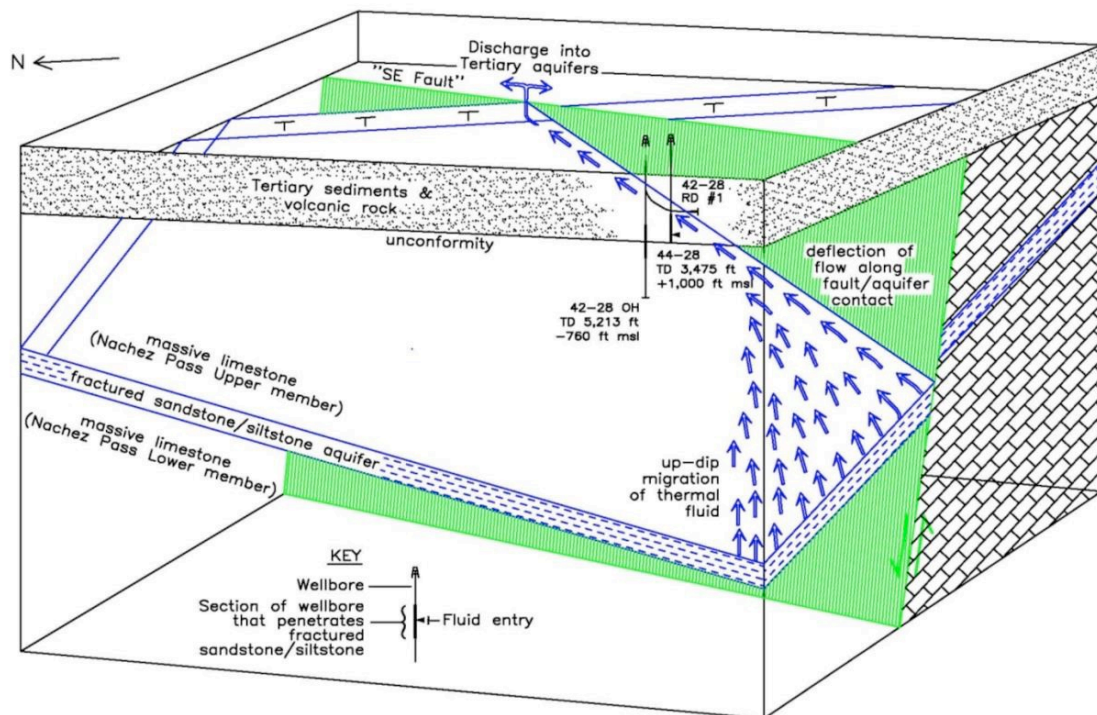


Figure 10 – Example of a 3D conceptual block-model (IFC-IGA, 2013)

Parameters needed for development of conceptual models

A list of items that a conceptual model should address is presented below. It should be kept in mind that much of this data will not be available for the preliminary modelling. Therefore, the conceptual model may be crude to start with, but will be updated and refined, especially as drilling data is acquired. However, the first wells need to be sited based on a preliminary model, where ideally the data of at least the first four categories below are covered.

1. Likely reservoir temperature

This can be estimated, using:

- Chemical geothermometry
- Resistivity
- Gradient well data
- Deep well data

2. Likely areal size of the geothermal system and thickness of the reservoir

This can be estimated, using:

- Surface manifestations (often minimum size)
- Resistivity and other geophysical surveys
- Gradient well data
- Deep well data
- Geology
- Structural settings

3. Geological conditions controlling the geothermal system

This can be estimated, using

- Topography

- Stratigraphy (Type of reservoir rock and cap rock)
- Structural setting, mainly information on faults and fractures
- Tectonic setting

4. Boundary conditions for the geothermal system

This can be estimated, using

- Topography
- Stratigraphy
- Structural settings
- Upflow and outflow
- Recharge
- Temperature model

5. Hydrogeology and recharge area for the geothermal system

This can be estimated, using

- Topography
- Stratigraphy
- Structural settings
- Surface hydrology
- Soil coverage
- Precipitation
- Groundwater aquifer information

6. Likely geochemistry of fluids (incl. CO₂)

This can be estimated, using

- Types of surface manifestations
- Alteration mineralogy
- Liquid chemical composition
- Steam/gas composition
- Stratigraphy
- Hydrological conditions and residence time
- Geothermometry
- Mixing with cold groundwater

7. Heat source for the geothermal system

This may be assessed/located, using

- Regional geology
- Geothermometry
- Liquid chemical composition
- Steam/gas composition
- Stratigraphy
- Resistivity
- Gradient well data
- Deep well data
- Microseismicity

This is not an exhaustive list of data types. All other information that might be relevant to the geothermal resource in question and not mentioned in the above list can be helpful in developing the possible geothermal conceptual model.

Well drilling and completion should be followed by well testing, reservoir testing, monitoring during utilization and tracer testing to further assess both production and subsurface conditions. This enables the conceptual model to be continuously updated and refined, and any previous interpretations to be tested (IFC-IGA, 2013).

GEOTHERMAL RESOURCE ASSESSMENT

After completing the surface exploration and development of the conceptual model, the first step in evaluating the possible capacity of the geothermal resource will be to perform a preliminary volumetric resource assessment. This is based on a combination of:

- possible areal extent of reservoir.
- known and assumed temperature distribution.
- estimates of the depth and thickness of reservoir.
- properties of possible reservoir rocks, i.e. porosity, density, and heat capacity.
- reasonable assumptions about how much of the heat-in-place may be recovered at the wellhead using a recovery factor; and
- reasonable assumptions about the efficiency of converting heat to electricity, based on the performance of modern geothermal power plants.

Initially this information is based on surface exploration, but this will become more comprehensive with information gained from drilling the first exploration wells. To account for uncertainty in the various parameters, probabilistic calculations (e.g., Monte Carlo) are usually applied when performing a volumetric assessment of the reservoir. Using this method, probability distributions are defined for the various input parameters and the volumetric assessment results are presented as a probability distribution for capacity (usually MW_e or MW_{th}). Based on the resulting probability distribution for capacity P90, P50 and P10 values for the capacity estimates are defined and presented.

Appendix 4. Items to be addressed in a drilling program

Below is a general Table of Content for a standard drilling program. This serves as a guideline for the applicant when presenting their drilling program. The list below is indicative and some of items listed may not be relevant or may not be applicable, depending on the project.

Basic well data

- Introduction
- Objective
- Drilling prognosis, based on conceptual model
 - Well targets
 - Stratigraphic and structural conditions
 - Offset well data (if available)
 - Hydrothermal alteration
 - Depth to reservoir
 - Potential for Losses of Circulation
 - Expected Temperature and Pressure conditions
 - Potential for encountering kicks
 - Potential for encountering gas/gas kicks
- Detailed well design
 - Depth of well
 - Drilling diameters
 - Casing program
 - Casing specifications
 - Well head assembly
 - Type and pressure class of master valve
 - Side outlets and other valves
 - Expansion spool
 - Cellar design
 - Detailed drawings
 - Bill of Quantity (item list) for well design
 - Deviated/directional or vertical/straight
- Minimum Drill Rig Requirement, based on well design
- Design of well pad and mud pit
- Estimated Drilling Time
- Environmental and Social Management Plan (ESMP)
- Status of permits and licenses
- Bill of Quantity (item list) for drilling materials
- Information on procurement plan for material and equipment
- Cost estimation

Drilling

- Preliminary work
 - Well Pad
 - Mud Pit
 - Sampling of cuttings/core
 - Conductor Pipe and Mouse – Hole
 - Cellar
 - Water Supply
- Well drilling
 - Surface casing: – Inch Stage: XX" – Inch Surface Casing to XX m
 - Drill string and Bottom hole assembly (BHA)
 - Drilling description
 - Blow-Out Preventer (BOP) stack
 - Casing and cementing

- Intermediate casing: (if needed) - Inch Stage: XX" - Inch Anchor Casing to XXX m
 - Drill string and BHA
 - Drilling description
 - BOP stack
 - Casing and cementing
- Production casing - Inch Stage: XX" - Inch Production Casing to XX m
 - Drill string and BHA
 - Drilling description (Directional drilling?)
 - BOP stack
 - Casing and cementing
- Open hole - Inch Stage: XX" - Open hole with XX" Slotted Liner
 - Drill string and BHA
 - Drilling description
 - BOP stack
 - Slotted/perforated liner

Drilling fluid program

- Surface casing
- Anchor casing
- Production casing
- Open hole

General notes

- "Drilling on paper" exercise
- Drilling Parameters
- Underbalanced drilling or not
- Deviation or not
- Cementing
- Pressure Tests:
 - BOP Pressure Tests
 - Casing Pressure Tests
 - Formation Leak Off Tests
- Well logging during and after drilling (heat up)
- Mud logging by site geologist
- Geophysical logging
- Injection testing (see Chapter 6 on well testing)
- Decision on stimulation
- Hydrogen sulfide, carbon dioxide and hydrocarbon monitoring
- Rig instrumentation system
- Essential Parameters to be recorded by Drilling Contractor/Mud Logging Contractor and provided to Client (preferably online)
- Well completion
- Reporting
 - Rig daily report on drilling parameters
 - Site geologist daily report
 - Geophysical logging reports
 - Mud report
 - Casing reports
 - Cementing report
 - Directional drilling report (if applicable)
 - Meeting minutes

Standard casing designs that Well Cost Guideline is based on:

Four typical casing programs for HT wells are set up as basis for generic cost model calculations. These can be adapted to intermediate- and low- temperature cases, by eliminating unnecessary tasks and equipment not needed for lower temperature drilling.

It is also expected that some of the listed items may not apply, which will be considered on a case-by-case basis. The Beneficiary needs to provide cost estimates for proposed wells by taking the following items into account.

Tables 16 to 19 below correlate casing and bit sizes, while Figure 6 shows technical drawings of the casing programs. API casings and bits are used for casing programs of large, regular, and slim wells, but for cored well, a mix of API and wireline coring casings and bits are used.

Table 16 – Example of casing sizes, nominal weights, shoe depths, grades, connections and bit sizes for drilling phases of a large diameter well (ø12¼"). For shallower, low temperature drilling the casing depths and sizes may differ.

Drilling phase	Nominal size (OD) (in)	Nominal weight (lb/ft)	Casing shoe depths (m)	Grade	Connections	Bit size (in)
1.	22 1/2	117	90	X56	Welded	26
2.	18 5/8	87.5	350	X56	Welded	21
3.	13 3/8	68	1200	K55	BTC	17½
4.	9 5/8	47	3000	K55	BTC	12¼

Table 17 – Example of casing sizes, nominal weights, shoe depths, grades, connections and bit sizes for drilling phases of a regular diameter well (ø8½"). For shallower, low temperature drilling the casing depths and sizes may differ.

Drilling phase	Nominal size (OD) (in)	Nominal weight (lb/ft)	Casing shoe depths (m)	Grade	Connections	Bit size (in)
1.	18 5/8	87.5	90	X56	Welded	21
2.	13 3/8	68	350	K55	BTC	17½
3.	9 5/8	47	1200	K55	BTC	12¼
4.	7	26	3000	K55	BTC	8½

Table 18 – Example of casing sizes, nominal weights, shoe depths, grades, connections and bit sizes for drilling phases of a slimhole (ø6⅞"). For shallower, low temperature drilling the casing depths and sizes may differ.

Drilling phase	Nominal size (OD) (in)	Nominal weight (lb/ft)	Casing shoe depths (m)	Grade	Connections	Bit size (in)
1.	13 3/8	68	70	K55	BTC	17½
2.	9 5/8	47	250	K55	BTC	12¼
3.	7	26	800	K55	BTC	8½
4.	4 1/2	13.5	2000	K55	BTC	6⅞

Table 19 – Example of casing sizes, nominal weights, shoe depths, grades, connections and bit sizes for drilling phases of a cored well (ø2.97"). For shallower, low temperature drilling the casing depths and sizes may differ.

Drilling phase	Nominal size (OD) (in)	Nominal weight (lb/ft)	Casing shoe depths (m)	Casing type	Bit size (in)	Description
1.	7	26	50	API	8½	API
2.	4 1/2	13.5	200	HW casing or API	6⅞	HW casing or API
3.	3 1/2	-	700	NW casing	3.77	NW casing
4.	2 3/4	-	1500	Holed NQ rod	2.97	Holed NQ rod

BENEFICIARY MANUAL 3.1



Table 20 – Well Cost Guidelines. Overview of cost distribution estimation for drilling of large, regular and slim wells. To be used for eligible cost estimation during negotiations.

DESCRIPTION	Large 3000m	Regular 3000m	Slim 2000m
DRILLING WORKS			
Rig mobilization, equiv. to 11 rig day rates	4,8%	4,7%	5,3%
Rig demobilization, equiv. to 8 rig day rates	3,5%	3,4%	3,9%
Rig Rental, crew and BOP's	25,6%	25,7%	24,1%
Rig water supply	1,0%	1,1%	1,5%
Diesel fuel	4,3%	5,0%	4,3%
Directional services and tools	6,1%	7,0%	0,0%
Cementing services and equipment	2,4%	2,8%	3,7%
Tool rental	0,6%	0,7%	1,0%
Welding services and other	0,5%	0,6%	1,0%
SUM	48,8%	50,9%	44,7%
CASINGS AND DRILLING CONSUMABLES			
Well casings	5,3%	4,2%	3,0%
Casing hardware, cementing	0,5%	0,4%	0,5%
Wellhead valves and spools	1,5%	1,7%	1,8%
Drilling mud/polymers/additives	1,5%	1,2%	0,8%
Cement and additives	5,6%	2,1%	1,0%
Drill bits and stabilizers	2,9%	2,6%	2,2%
SUM	17,3%	12,4%	9,4%
DRILLING SITE			
Site preparation, cellar and ponds	3,2%	3,6%	5,8%
Utilities to site (electricity, water, communications)	0,5%	0,6%	1,0%
Security and geothermal field operators	0,8%	0,9%	1,4%
SUM	4,5%	5,1%	8,2%
SPECIALIST SERVICES			
Project manager and Company man + 20 days	2,6%	2,9%	4,1%
Wellsite geologist + 20 days	1,7%	2,0%	2,7%
Mud logging cabin w/ data acquisition	1,0%	1,1%	1,5%
Reservoir engineer for testing +14 days	0,4%	0,4%	0,6%
Mud engineer	1,0%	1,1%	1,5%
Wireline service	1,8%	2,0%	2,8%
Logging depth charge, wireline (table)	1,4%	1,7%	1,3%
Drillstem inspection	1,1%	1,2%	1,0%
Waste disposal	0,5%	0,6%	1,0%
Reports	0,5%	0,6%	1,0%
Lodging, catering, transportation, (see Crew table)	1,7%	1,9%	2,5%
SUM	13,6%	15,5%	19,8%
BASE ESTIMATE FOR DRILLING	84,2%	83,9%	82,1%
WELL FLOW TEST long term	2,7%	3,0%	4,9%
CONTINGENCY	13,1%	13,0%	13,0%
EST. DRILLING AND TESTING COST, TOTAL	100,0%	100,0%	100,0%

Appendix 5. Well Testing – Examples and schematic figures for well testing

This Appendix shows examples of well testing methods and practices. The Beneficiary must provide a description of injection testing at the end of drilling and description on how he plans to carry out the flow testing of each well.

Well testing by airlifting or use of downhole pump, is not needed in cases where artesian flow is sufficient to meet the SC. However, if a well does not reach the SC through artesian flow, it must be tested by using airlifting or downhole pumps to confirm if the yield is within the SC or not.

In general, well testing can either be carried out by airlifting or by the use of downhole pumps (pumping test).

The following are examples of such testing. These may be used as examples for the Beneficiaries flow testing plans.

Airlift tests to characterize geothermal wells

Applications:

- Evaluating short-term sustainable yield of wells. Is also be used to clean wells after drilling.
- Hydraulic test characterization, short-term production testing.

Working principle:

- By injecting air (N_2), or using an air compressor, in a deep point of the well (200 – 500 m below ground level), the density of the fluid in the well above the air-injection point is reduced. As air injection proceeds, an increasing part of the water column is mixed with air and starts to move upwards in the riser pipe.
- Sufficient well productivity can be partly compensated by increased drawdown during pumping.
- Both air pressure and air volume are important when initiating and maintaining an airlift pumping operation.

An example for required equipment (Figure 14, Figure 15, Figure 16):

- Workover rig (if needed), generator, airlift-pipe, geothermal fluid storage capacity, gas-water separator.
- Cooling units are required if the produced fluid is planned to be injected in the sewer system (Figure 14).
- High performance compressor. The compressor is selected based on the anticipated production rate, expected lifting height and corresponding air-pressure. As a rule-of-thumb, 0.007 m³/s of air flow is required for each 1 l/s of water of the anticipated pumping rate (see Figure 13).
- Data acquisition system and sensors to record pressures, temperatures, production rate (Figure 14, Figure 15, Figure 16). Important parameters should be recorded redundantly. The water fraction can be measured using a Thomson weir and/or a magnetic flowmeter.

- Alternatively, a mass-flow meter can be deployed in the production line before the water/vapor separator.
- Fluid sampling ports (Figure 16 and Figure 17) Enthalpy values depend on the chemical composition of fluid. To estimate the gas output of the wells, gas sampling will be needed (Figure 18). Fluid sampling from the production line is therefore important.

Typical case in the low-enthalpy geothermal domain:

- Airlift pipe (or drill string) to be placed 250 – 500 m into the borehole, depending static water level in borehole (suggested pipe sizes see Figure 12).
- Production start with a couple of geyser-like production bursts until the fluid column above the air in injection column is sufficiently homogenized. Continuous flow starts when the weight of the fluid-column in the riser pipe is sufficiently lowered and the pressure gradient from reservoir to well is sufficient to produce a steady flow.
- The submergence of the air pipe is typically around 50% (Figure 13, right).
- Airlift testing in geothermal is often an iterative process, from setting up / optimizing the equipment (at well cleaning stage), often with stop-and-go production, to smooth operation towards the final hydraulic testing phase. By heating up the well and removal of drilling mud (e.g. present as mud-cake at the wellbore), the borehole becomes more productive with consecutive air-lifting operations.

Caution / Disadvantages of method:

- In case of risk of presence of gas, compressed nitrogen (N₂) should be used instead of compressed air.
- Possible mineral depositions and/or corrosion in case of long-term use.
- For correct test design, approximate well output needs to be known beforehand. As this is usually not the case, trial-and-error approach is common practice.

Pumping tests to characterise geothermal wells.

In general, the approach of pumping tests using a submersible pump (ESP) is similar to that of airlifting. Instead of using compressed nitrogen or compressed air using air compressor and airlift-pipes, the ESP is lowered into the well at a similar depth as the string in airlifting. Using an ESP for flow testing can give more stable results and can usually be carried out over a longer period of time (long term test, for weeks) than airlifting, allowing for better estimate of the long-term sustainable level of output.

The parameters that must be taken into account when planning to use an ESP are:

- Size of pump. It must fit within the production casing of the well.
- Capacity of the pump. It must be able to pump at least the flowrates needed to test the SC.
- It must have the capacity to lift the fluids in accordance with the maximum expected drawdown.
- It must be specified to tolerate the expected temperature of the fluids to be pumped.

- Content of sand in the pumped water needs to be in accordance with the pump specification

References:

- Driscoll, F.G., 1986: Groundwater and wells (2nd ed.). Johnson Screens, St. Paul, MN, US, 1089 pp.
- Gotuato, J. G. (2015): The thermodynamics behind initiation of flow from geothermal wells (2015). The United Nations University, Geothermal Training Programme (UNU-GTP), Reports 2015, Number 15.
- Kunaruk, U. (1991): Design and selection of deep well pumps for geothermal wells. The United Nations University, Geothermal Training Programme (UNU-GTP), Report 8, 1991.
- Thorhallson, S. (2003). Geothermal well operations and maintenance. The United Nations University, Geothermal Training Programme (UNU-GTP), IGC 2003. Short Course September 2003.

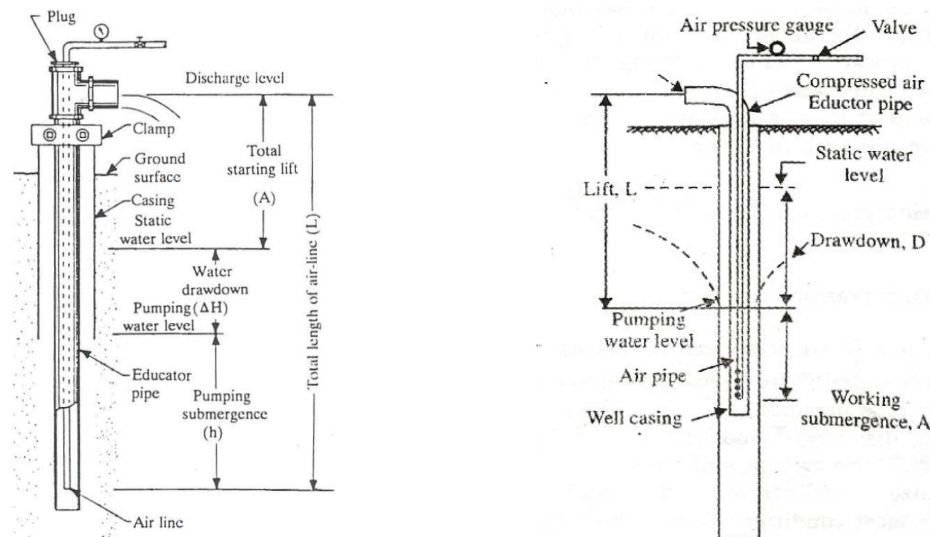
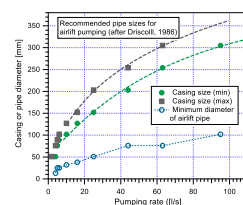


Figure 11 – Air-lift schematic sketches: The educator pipe is optional (its function can be fulfilled by the the casing)

Pumping rate		Size of casing (or educator pipe)		Minimum diameter of airlift pipe	
[l/s]		[in]	[mm]	[in]	[mm]
from	to				
2	4	2	51	0.5	13
4	5	3	76	1	25
5	6	3.5	89	1	25
6	10	4	102	1.25	32
10	16	5	127	1.5	38
16	25	6	152	2	51
25	44	8	203	3	76*
44	63	10	254	3	76*
63	95	12	305	4	102



*) corrected compared to source to suit values given in inches. (3" = 76 mm not 64 mm, as given in Kunaruk, 1991)

Figure 12 – Air pipe and corresponding casing sizes

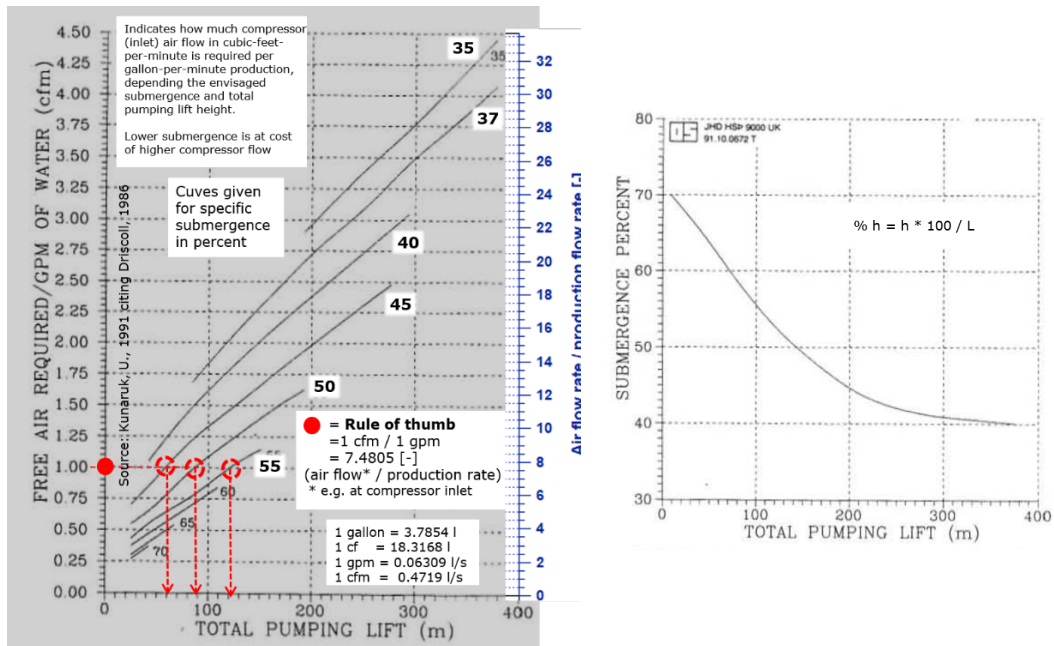


Figure 13 – Left: Air flow required for production. Right: Approximate percent pumping submergence for optimum airlift efficiency (Driscoll, 1986, cited in Kunaruk, U. (1991).

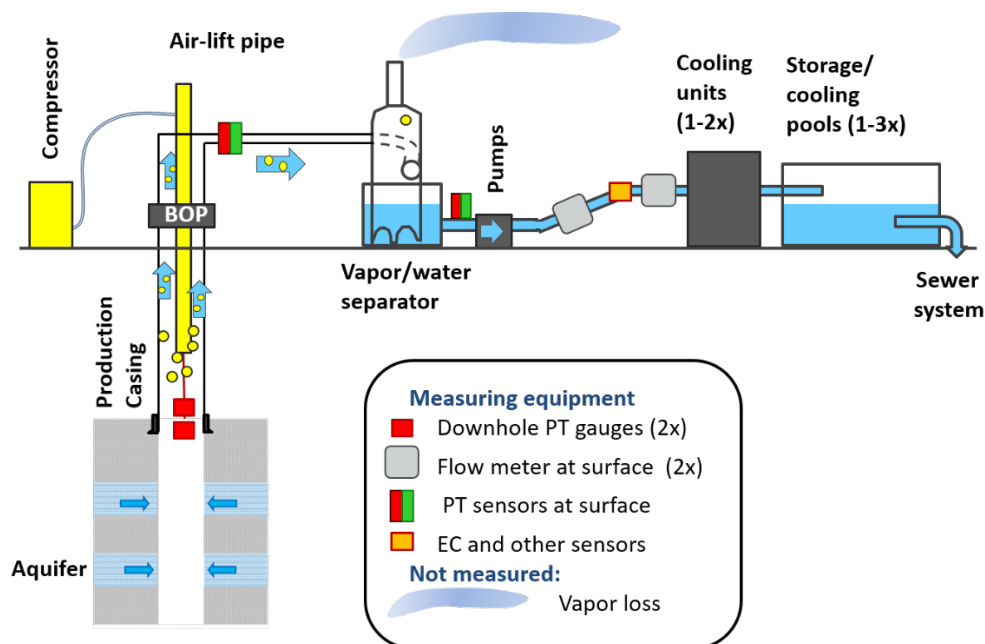
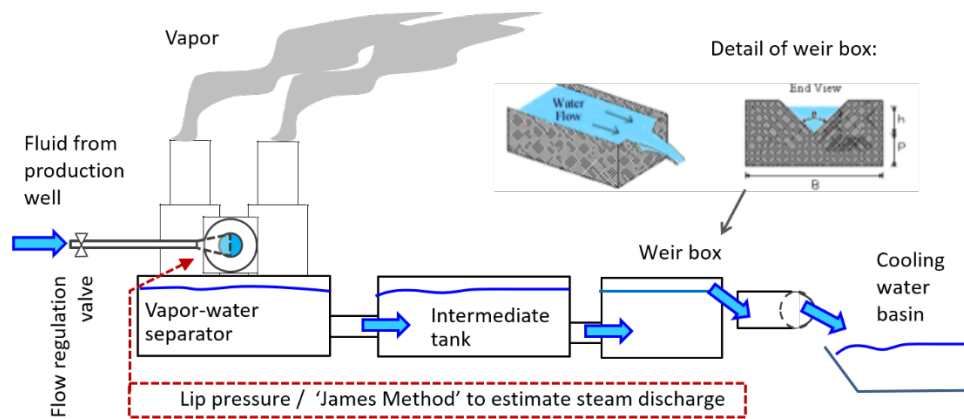


Figure 14 – Production set-up using airlifting in case of moderate temperatures up to ~140 °C. Flow rates can be measured using magnetic-inductive flow meters (or mass flow meters) and vapor loss is smaller than 5 % of mass-flow production.



Estimate steam fraction (F) from enthalpy values
(measured, calculated, from steam tables):

$$F = (H_{ini} - H_{liq}) / (H_{vap} - H_{liq})$$

$$= (H_{ini} - H_{liq}) / \Delta H_{vap}$$

H_{ini} = Enthalpy of initial fluid

H_{vap} = Enthalpy of vapor phase

ΔH_{vap} = Latent heat

h_{liq} = Enthalpy of liquid phase

Figure 15 – Production set-up (surface part only) in case of elevated temperatures, ~140 to ~180 °C. The pressure and temperature sensors required (not shown here, see next Figure below) should be setup such to ensure that vapor loss can be quantified independently by using the lip pipe (James' Method) and by estimating the steam fraction based on enthalpy calculations.

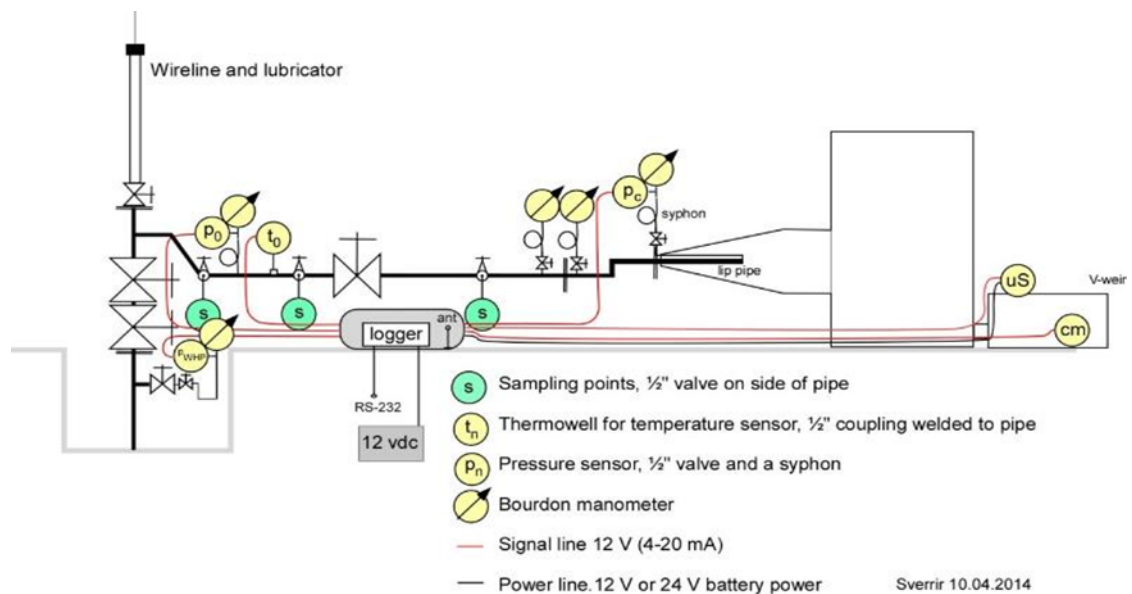


Figure 16 – Schematic overview of surface equipment and data sampling points commonly used during flow-testing of two-phase geothermal wells.

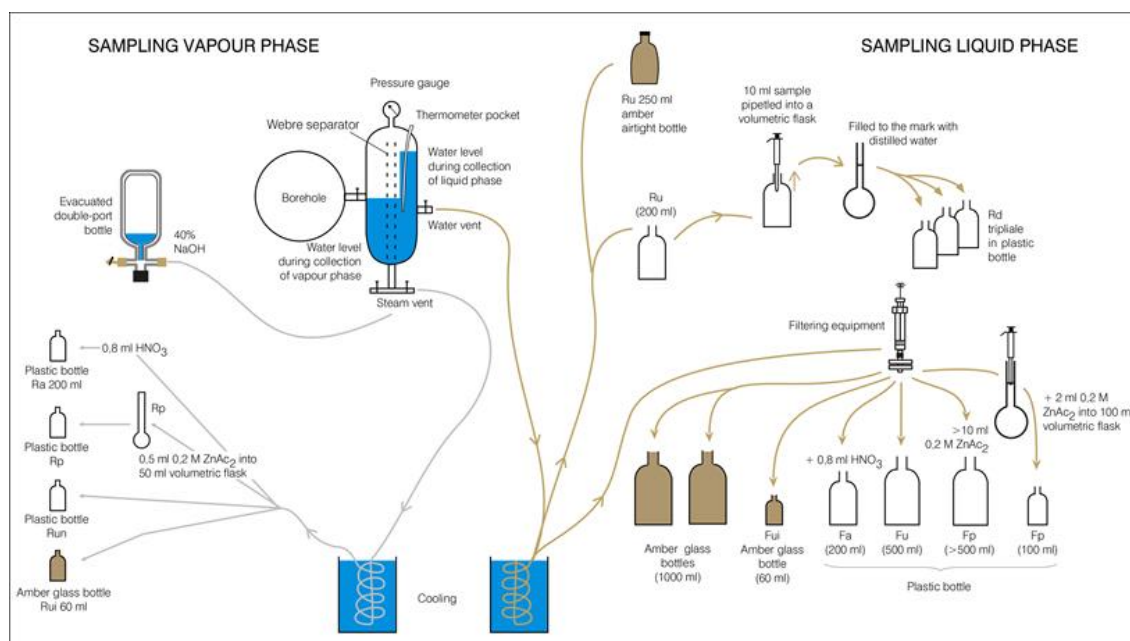


Figure 17 – An example of setup for chemical sampling of two-phase flow, using a Weber sampling separator

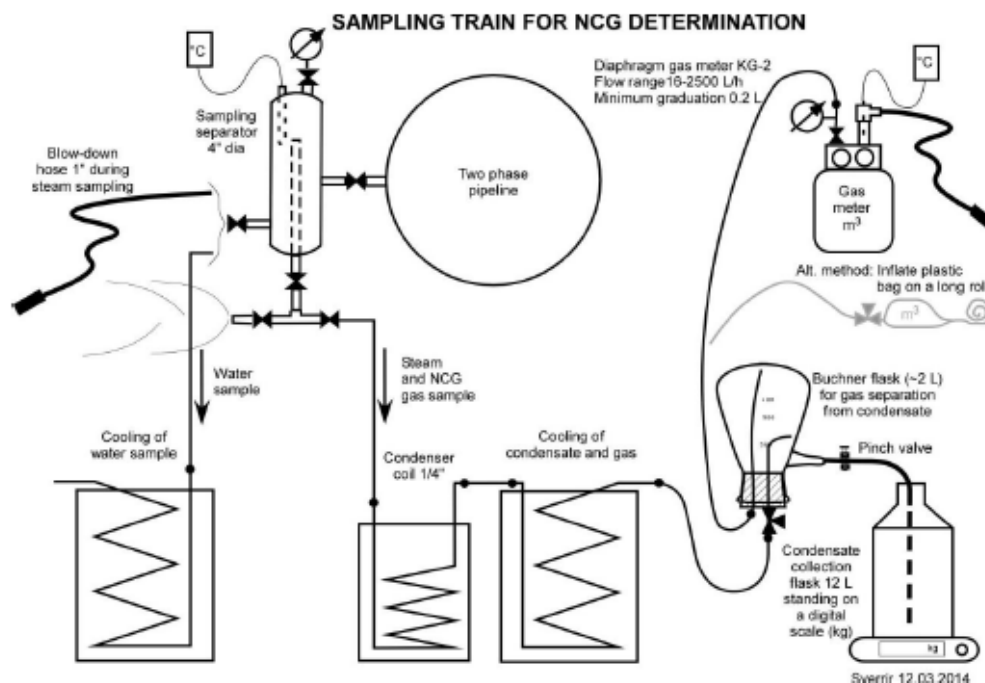


Figure 18 – An example of setup for Non-Condensable Gas (NCG) determination

Appendix 6. Ideal team composition

1. Applicant experience and references

Each application shall include a thorough description of the Beneficiary's experience (and/or its key consultants) in geothermal exploration, drilling and utilization. In addition, experience in dealing with environmental and social safeguards needs to be demonstrated.

2. Experience of key experts

Applicants shall present a team of experts that will be responsible for the implementation of the BA. The team will be responsible for the field activities, reporting and communication with the RSM Unit.

The Applicant's team must consist of specialists identified in Table 21 below. However, well testing experts, reservoir engineers and geochemists are not required in cases where slim wells are to be drilled but not tested.²³ It is possible that one individual may be responsible for more than one of the required disciplines.

Each application shall include a list of the experts proposed for the team, including CV's for both key and non-key experts, demonstrating their relevant experience in their fields of expertise and detail their experience in similar projects.

Table 21 – Experts required for drilling and testing activities

Item	Expert/ position
1	Team leader/Project coordinator
2	Drilling supervisor
3	Drilling engineer
4	Well testing expert
5	Reservoir engineer
6	Geochemist
7	Geologist
8	Environmental specialist
9	Occupational health and safety specialist
10	Social safeguards specialist

Team leader/Project coordinator

The Team Leader needs to hold a university degree in geoscience, engineering or similar, and have practical experience in geothermal exploration or geothermal drilling activities. The team leader will check the well design and well drilling and testing to be consistent with industry best practices (New Zealand Standard, 2015: Code of practice for deep geothermal wells. Standards New Zealand, Wellington, NZ, 102 pp.). The Team Leader needs to have at least seven (7) years of experience as a project manager in similar projects. The Team Leader needs to have practical experience in successfully managing

²³ Thermal gradient wells (or slim wells) will be used for temperature/pressure logging, but these wells will not be tested (i.e. flow tested).

exploration projects involving geoscientific studies. It is highly recommended that the Team Leader has experience in developing geothermal conceptual models.

Drilling supervisor

The drilling supervisor needs to hold a university degree in engineering or similar, a valid international well control certificates approved by IWCF and have practical experience in drilling activities, preferably geothermal drilling. The drilling supervisor needs to have at least four (4) years of experience as a professional geothermal specialist.

Drilling engineer

The drilling engineer will be responsible for drilling plans and well designs. The drilling engineer needs to hold a university degree in engineering and have practical experience in geothermal exploration or geothermal drilling activities. The drilling engineer needs to have at least four (4) years of relevant experience.

Well testing expert

The well testing expert will be responsible for design and setup of well testing equipment and all well testing activities, including downhole temperature and pressure logging, discharge measurements. The well testing expert needs to hold a university degree in engineering or geoscience and have practical experience in flow testing activities. Preferably the well testing expert needs to have at least four (4) years of experience.

Reservoir engineer

The reservoir engineer will, in cooperation with other team experts, be responsible for evaluation of information about the nature of the reservoir (temperature and permeability) and drilling targets. The reservoir engineer needs to hold a university degree and have practical experience in geothermal exploration and flow testing. The reservoir engineer needs to have at least four (4) years of relevant experience.

Geochemist

The geochemist will be responsible for sampling during well testing and geochemical interpretation. The lead geochemist needs to have a university degree or equivalent in geochemistry or chemistry and preferably four (4) years of experience as a geothermal geochemist. This person needs to have solid experience in collection of water and gas samples for chemical analysis and interpretation of geochemical data with respect to geothermometry and production properties.

Geologist

The geologist will be responsible for on-site mud logging, identification of stratigraphy, hydrothermal mineralogy, and geological context of feed points. The lead field geologist needs to have a university degree or equivalent in geology and preferably four (4) years of experience as a geothermal geologist. This person needs to have a solid experience in mud logging for geothermal exploration purposes.

Environmental specialist

The environmental and social safeguard specialist will be responsible for all environmental safeguard issues under the RSM. The safeguard specialist will monitor timely implementation of safeguard provisions stipulated in the safeguard documents of the Project as well as ensure adequate monitoring and implementation of safeguard provisions and other key activities. The environmental and social safeguard specialist

needs to have an advanced university degree or equivalent in environmental or social sciences and preferably five (5) years of relevant experience.

Occupational health and safety specialist

The occupational health and safety specialist will be responsible for all safeguard issues about occupational health and safety under the RSM. The specialist will monitor timely implementation of OHS safeguard provisions stipulated in the safeguard documents of the Project as well as ensure adequate monitoring and implementation of safeguard provisions and other key activities. The occupational health and safety specialist needs to have an advanced university degree or equivalent and preferably five (5) years of relevant experience.

Social safeguard specialist

The social safeguard specialist will be responsible for all safeguard issues about social aspects under the RSM. The specialist will monitor timely implementation of social safeguard provisions stipulated in the safeguard documents of the Project as well as ensure adequate monitoring and implementation of safeguard provisions and other key activities. The social safeguard specialist needs to have an advanced university degree or equivalent and preferably five (5) years of relevant experience.

Appendix 7. Formulas for calculations of success criteria

Two Phase Power Output Formula to be Applied for Condensing Power Plant

When well testing a two-phase production well, the following formula shall be applied to establish the Power Output (PO) of the well as it pertains to the requirements of a Condensing Power Plant. The calculated PO will then be compared to the Power Output. If the calculated PO meets or exceeds the stated PO Threshold Value and the minimum wellhead pressure is met or exceeded, the well will be deemed a success and the Beneficiary shall pay the RSM Facility pursuant to the RSM payment terms. If the calculated PO is less than the stated PO Threshold Value or the minimum wellhead pressure is not met, the well will be deemed a failure and the RSM Facility shall pay the Beneficiary pursuant to the RSM payment terms.

$$PO[MW_e] = \frac{Q_{P_i}^s [kg/s]}{SCF_{P_i} [kg/s/MW_e]}$$

Where

- $Q_{P_i}^s$ is the steam flow at the planned inlet pressure, defined as:

$$Q_{P_i}^s = Q_{P_s}^s + Q_{P_s}^l * \frac{h_{P_s}^l - h_{P_i}^l}{h_{P_i}^v - h_{P_i}^l}$$

- $Q_{P_s}^s$ and $Q_{P_s}^l$ are the flow of steam and liquid respectively at the sampling pressure
- h refers to the specific enthalpy of liquid (l) and vapor (v) at sampling pressure (P_s) and planned inlet pressure (P_i)
- SCF_{P_i} refers to the steam consumption factor of the anticipated turbine at the anticipated inlet pressure as stated above.

Two Phase Power Output Formula to be Applied for Binary Power Plant

When well testing a two-phase production well, the following formula shall be applied to establish the Power Output (PO) of the well as it pertains to the requirements of a Binary Power Plant. The calculated PO will then be compared to the PO Threshold Value for the Beneficiary's Binary Power Plant (when applicable). If the calculated PO meets or exceeds the stated PO Threshold Value and the minimum wellhead pressure is met or exceeded, the well will be deemed a success and the Beneficiary shall pay the RSM Facility pursuant to the RSM payment terms. If the calculated PO is less than the stated Power Output Threshold Value or the minimum wellhead pressure is not met, the well will be deemed a failure and the RSM Facility shall pay the Beneficiary pursuant to the RSM payment terms.

$$PO[MW_e] = Q^T \left[\frac{kg}{s} \right] * \Delta h \left[\frac{kJ}{kg} \right] * 10^{-3} \left[\frac{MW_{th}}{kW_{th}} \right] * \eta_{th} \left[\frac{MW_e}{MW_{th}} \right],$$

Where

- Q^T is the total flow from the well
- Δh is the difference between the wellhead discharge enthalpy and the enthalpy of liquid water at the power plant outlet temperature as stated above.
- η_{th} is the thermal efficiency factor for the planned power plant as stated above.

Two Phase Well CO₂ Threshold Value for Condensing Power Plants

The drilling program will be terminated if the projected CO₂ emission factor (EF_{CO_2}) resulting from the use of a Condensing Power Plant is equal to or greater than 555 g/kWh when applying the following formula (CO₂ Emission Factor Formula for Condensing Power Plants):

$$EF_{CO_2} \left[\frac{g}{kWh} \right] = SCF \left[\frac{kg/s}{MW} \right] * C_{CO_2}^{s,P^i} \left[\frac{mg}{kg} \right] * 3.6 \left[\frac{MW_s}{kWh} \right] * \frac{1}{1000} \left[\frac{g}{mg} \right]$$

Where

- $C_{CO_2}^{s,P^i}$ is the concentration of CO₂ in steam at the inlet pressure to the planned power plant as stated above.
- The $C_{CO_2}^{s,P^i}$ is related to the measured concentration of CO₂ in steam, i.e. at sampling pressure ($C_{CO_2}^{s,P^s}$), through the following equation:

$$C_{CO_2}^{s,P^i} = C_{CO_2}^{s,P^s} * \frac{X^{P^s}}{X^{P^i}},$$

Where

- X^{P^s} and X^{P^i} represent the steam fraction at P^s and P^i , respectively
- X^{P^s} and X^{P^i} are computed as:

$$X^{P^s} = \frac{h^{td} - h^{l,P^s}}{h^{v,P^s} - h^{l,P^s}} \text{ and } X^{P^i} = \frac{h^{td} - h^{l,P^i}}{h^{v,P^i} - h^{l,P^i}},$$

Where

- h^{td} is the enthalpy of the total discharge (kJ/kg)
- h^v and h^l are the enthalpy of vapor and liquid (kJ/kg), respectively at the superscripted pressure.

Two Phase Well CO₂ Threshold Value for Binary Power Plants

The drilling program will be terminated if the projected CO₂ emission factor (EF_{CO_2}) resulting from the use of a Binary Power Plant is equal to or greater than 555 g/kWh when applying the following formula (CO₂ Emission Factor Formula for Binary Power Plants):

$$EF_{CO_2} = \frac{3600 \left[\frac{kJ}{kWh} \right]}{\Delta h \left[\frac{kJ}{kg} \right] * \eta_{th}} * C_{CO_2}^{tf} \left[\frac{mg}{kg} \right] * 10^{-3} \left[\frac{g}{mg} \right]$$

Where

- Δh is the difference between the wellhead discharge enthalpy and the enthalpy of liquid water at the power plant outlet temperature as stated above.
- η_{th} is the thermal efficiency factor for the planned power plant as stated above.
- $C_{CO_2}^{tf}$ is the concentration of CO₂ in the total discharge fluid.

Single Phase Power Output Formula to be Applied for Binary Power Plant

When well testing a Single Phase Production Well, the following formula shall be applied to establish the Power Output (PO) of the well as it pertains to the requirements of a Binary Power Plant. The calculated PO will then be compared to the PO Threshold Value for the Beneficiary's Binary Power Plant (when applicable). If; i) the calculated PO meets or exceeds the stated Power Output Threshold Value; and, ii) the minimum liquid temperature at the wellhead is met or exceeded; and, iii) the single phase maximum drawdown is met or exceeded, then the well will be deemed a success and the Beneficiary shall pay the RSM Facility pursuant to the RSM payment terms. If; i) the calculated PO does not meet the stated PO Threshold Value; or, ii) the minimum liquid temperature at wellhead is not met; or, iii) the single phase maximum drawdown is not met, then the well will be deemed a failure and the RSM Facility shall pay the Beneficiary pursuant to the RSM payment terms.

$$PO[MW_e] = Q^T \left[\frac{kg}{s} \right] * \Delta h \left[\frac{kJ}{kg} \right] * 10^{-3} \left[\frac{MW_{th}}{kW_{th}} \right] * \eta_{th} \left[\frac{MW_e}{MW_{th}} \right],$$

Where

- Q^T is the total mass flow from the well
- Δh is the difference between the discharge enthalpy at the wellhead and the enthalpy of liquid water at the binary power plant outlet temperature as stated above.
- η_{th} is the thermal efficiency factor for the planned power plant as stated above.

Single Phase Thermal Output Formula to be Applied for Thermal Application

When well testing a Single-Phase Production Well, the following formula shall be applied to establish the thermal output (TO) of the well as it pertains to the requirements of a Thermal Application. The calculated TO will then be compared to the Thermal Output Threshold Value for the Beneficiary's Thermal Application (when applicable). If; i) the calculated TO meets or exceeds the stated TO Threshold Value; and, ii) the minimum liquid temperature at the wellhead is met or exceeded; and, iii) the single phase maximum drawdown is met or exceeded, then the well will be deemed a success and the Beneficiary shall pay the RSM Facility pursuant to the RSM payment terms. If; i) the calculated TO does not meet the stated TO Threshold Value; or, ii) the minimum liquid temperature at wellhead is not met; or, iii) the single phase maximum drawdown is not met, then the well will be deemed a failure and the RSM Facility shall pay the Beneficiary pursuant to the RSM payment terms.

$$TO = Q \left[\frac{kg}{s} \right] * \Delta h \left[\frac{kJ}{kg} \right] * 10^{-3} \left[\frac{MW}{kW} \right]$$

Where

- Q is the total mass flow from the well
- Δh is the difference between the discharge enthalpy at the wellhead and the enthalpy of liquid water at the thermal energy application outlet water temperature as stated above.

Single Phase Well CO₂ Threshold Value for Binary Power Plants

The drilling program will be terminated if the projected CO₂ emission factor (EF_{CO_2}) resulting from the use of a Binary Power Plant is equal to or greater than 555 g/kWh when applying the following formula (CO₂ Emission Factor Formula for Binary Power Plants):

$$EF_{CO_2} = \frac{3600 \left[\frac{kJ}{kWh} \right]}{\Delta h \left[\frac{kJ}{kg} \right] \eta_{th}} \times C_{CO_2} \left[\frac{mg}{kg} \right] \times 10^{-3} \left[\frac{g}{mg} \right]$$

Where

- Δh is the difference between the wellhead discharge enthalpy and the enthalpy of liquid water at the power plant outlet temperature as stated above.
- C_{CO_2} is the concentration of CO₂ in the liquid.
- η_{th} is the thermal efficiency factor for the planned power plant as stated above.

Single Phase Well CO₂ Threshold Value for Thermal Energy Applications

The drilling program will be terminated if the projected CO₂ emission factor (EF_{CO_2}) resulting from use in a Thermal Energy Application is equal to or greater than 555 g/kWh when applying the following formula (CO₂ Emissions Factor Formula for Thermal Energy Application):

$$EF_{CO_2} = \frac{3600 \left[\frac{kJ}{kWh} \right]}{\Delta h \left[\frac{kJ}{kg} \right]} \times C_{CO_2} \left[\frac{mg}{kg} \right] \times 10^{-3} \left[\frac{g}{mg} \right]$$

Where

- Δh is the difference between the wellhead discharge enthalpy and the enthalpy of liquid water at the heat exchanger outlet /re injection well outlet temperature, as it is stated above.
- C_{CO_2} is the concentration of CO₂ in the liquid.

Water-level depth formula:

The water-level depth after 5 years of production from a single well, should be predicted by first estimating the water-level depth (h_0) for the required mass flow rate (Q_0) on basis of the outcome (water-level vs. mass flow) of the test. Secondly, the water-level depth should be extrapolated up to 5 years using slope m on a semi-logarithmic timescale (time logarithmic and water-level linear) using the following equation based on the hydrological model:

$$\text{water-level depth} = m \cdot \log(\text{time}) + h_0, \text{ with } m = \frac{2.3Q_0}{4\pi gT}$$

Here, g is the acceleration of gravity and T the transmissivity (kH). The transmissivity is estimated through analysis of the production test data.

Appendix 8. Draft Beneficiary Agreement (BA)

[Provided as separate document]

Appendix 9. Environmental and Social Management Framework (ESMF)

1. Environmental licensing of geothermal development projects

The development of a geothermal power project is commonly broken down in the four phases summarized below:

- i. Exploration Phase – This phase will establish the location, size, and quality of the geothermal reservoir; activities conducted include surface exploration, followed by exploration and confirmation drilling.
- ii. Resource/Field Development Phase – This phase includes the drilling of the wells, which will be used to extract the geothermal resource from the reservoir and confirm its commercial viability for energy generation production; activities conducted are capacity drilling (also called production drilling) and development of steam gathering system.
- iii. Power Plant Development Phase – This phase consists of the final design and construction of the power plant that utilizes the geothermal energy.
- iv. Facility Operations Phase – This phase includes the operation and maintenance of the steam gathering systems and the power plant.

Exploration License

Geothermal exploration (including drilling works) is subjected to Turkish Environmental Impact Assessment (EIA) Regulation and treated as Annex II project. Therefore, before exploration license application, a Project Information File (PIF) which provides information about exploration site, environmental impacts and mitigation measures, together with official opinions about relevant agencies (State Hydraulic Works, Ministry of Culture and Tourism, etc.) should be prepared and submitted to Provincial Directorates of Environment and Urbanization (PDEU). After having “EIA not Required” decision of PDEU, the project owner applies to the Provincial Special Administration (or Governorate at Metropolitan Municipality Areas) for the license with information about exploration project, stating the plate name and its coordinates drawn to a scale of 1/25000. Size of the licensing area should not exceed 2,023 hectares.

The duration of an exploration license is three (3) years, commencing as of the date of the registration of the license and may be extended up to one (1) year with the consent of the Provincial Special Administration (or Governorate), on the condition that the revised project is found to be satisfactory. After acceptance of the license extension, General Directorate of Mining Affairs (MİGEM) is informed.

Operation License

Exploration license holder (project owner) applies to the Administration for an operating license before the expiration date of the exploration license. The project owner must specify a deadline to initiate the operation. The failure to start the operation before the specified term will give rise to the cancellation of the licenses and the guarantee deposited will be recorded as revenue by the State. The project owner cannot make any amendment regarding the project without the consent of the Provincial Special Administration (or Governorate). The duration of the license is thirty (30) years, commencing as of the date of the registration of the license and may be extended up to further ten (10) years. After receiving the operating license, the project owner should

obtain other required permits, including "EIA not Required" or "EIA Positive" decision. In that respect EIA studies should be started within three (3) months, otherwise the license may be cancelled. The "EIA not Required" or "EIA positive" decision is also required by EMRA to obtain an electricity generation license.

Operation must be conducted under the supervision of an engineer from a related field as a technical responsible person. In the absence of such engineer during the operation, the amount deposited as a guarantee will be deemed to be recorded as revenue by the State and the operation will be suspended. Moreover, the technical responsible person must prepare operating and prospecting report to be submitted annually to the Provincial Special Administration (or Governorate) until the end of March and every other consecutive year.

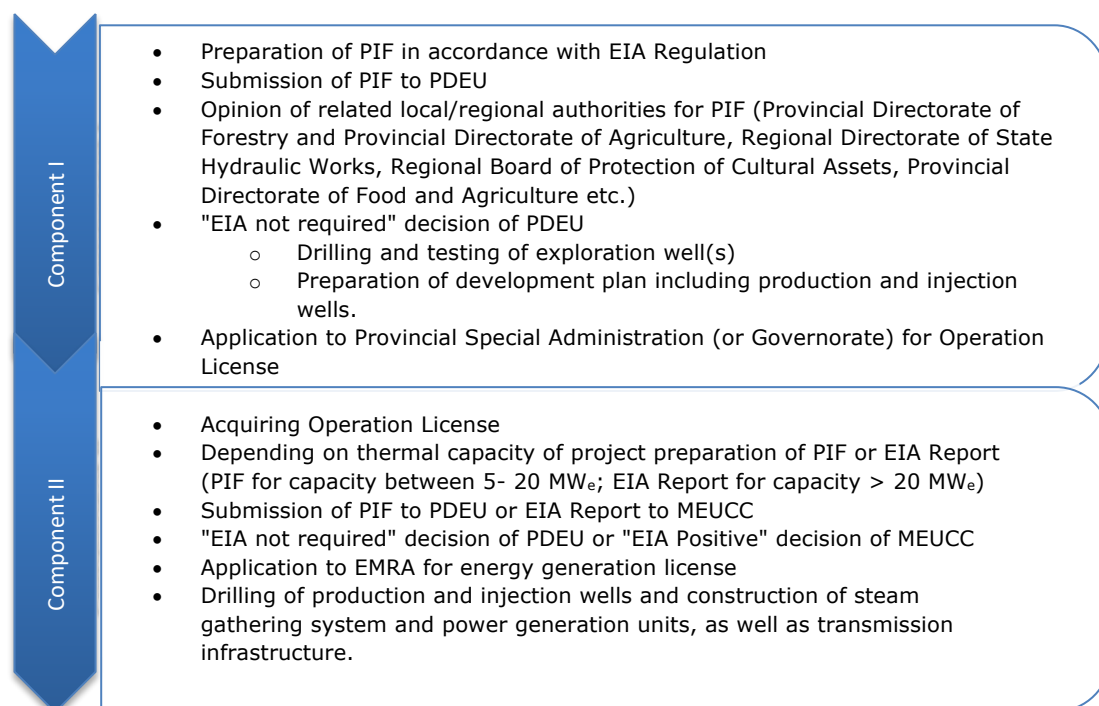


Figure 19 – RELATED ACTIVITIES OF COMPONENT I & COMPONENT II

2. Description of Potential Impacts and Mitigation Measures

It may be required to prepare a full EIA scoped with safety guidelines below:

Exploration phase

Drilling is the most effective method in geothermal exploration. Slim and shallower holes as compared to production wells are often drilled, in many cases not deeper than 1,000 m. However, medium-size or full-size exploration wells are also often drilled as exploration and confirmation wells, which can later be used as production or reinjection wells. Temperature gradients and other geothermal characteristics are measured to provide information for determining and estimating the geothermal potential. Prior to drilling, surface exploration activities such as resistivity and seismic measures are carried out to produce a first conceptual model of the geothermal reservoir and locate the most appropriate targets for exploratory drilling.

Impacts from surface exploration activities are expected to be minimal or non-existent. Potential impacts from exploratory drilling activities will be similar to those of production/capacity drilling and are discussed below.

Resource Development and Power Plant Development Phases

The main components of a geothermal power project are production wells, reinjection (or recharge) wells, brine, and condensate pipelines, pumping station(s), and the power plant. There will be also new access roads and land clearing as necessary to facilitate development. Opening production and reinjection wells requires deep drilling. Well depth can vary greatly depending on the characteristics of the reservoir and the location of the resource from about 1,000 m to over 2,500 m.

Most potential environmental and social impacts of geothermal development are associated to the resource and power plant development phases. A summary of such impacts is presented below:

a) Fluids involved in geothermal drilling and production

Effluents of geothermal development projects can be classified as i) drilling fluids; ii) spent geothermal fluids; iii) reject water from injection wells; iv) well cleaning water (for clogging); and v) domestic wastewater.

- i. *Drilling Fluids:* Freshwater is commonly used as a drilling fluid (circulation water) during drilling in the production zone of the reservoir. The purpose of the drilling fluid is to cool and lubricate the drilling equipment and carry rock cuttings out of the well. In some cases, synthetic drilling polymers are injected to form high-viscosity polymer slugs to facilitate clean-out. Commonly used drilling polymers include xanthan gum and starch and cellulose derivatives. Geothermal water extracted during well testing period is also considered as a drilling fluid. In some cases, geothermal water may be saline and contain elevated concentrations of components such as Arsenic and Boron.
- ii. *Spent Geothermal Fluids:* These effluents consist of water from steam separators and condensate derived from spent steam condensation following power generation.
- iii. *Reject Water from Injection Well:* These effluents are produced during reinjection of geothermal water. This is a small amount, which is rejected by the geothermal source due to pressure.
- iv. *Cleaning Water:* During the operation of wells, periodical cleaning is sometimes done using chemicals including strong acids, most commonly hydrochloric acid. The acids dissolve and remove mineral deposits from the wells and the surroundings. Before wells are subjected to acid treatment, it needs to be ensured that the well casings are leak proof to prevent any leakage of the acids to shallow groundwater aquifers. The acids are partially neutralized by dissolving the deposited minerals and then diluted through post-injection of fresh water or geothermal brine and finally by mixing with geothermal fluids in the reservoir before discharge.
- v. *Domestic Wastewater:* These effluents are produced because of daily activities of workers during surface exploration, drilling and operation of a geothermal project.

b) Drilling Mud

Water based drilling mud is widely used as a drilling fluid in geothermal drilling in Türkiye, particularly when drilling through the cap rock of the reservoir. Drilling mud typically consists of water mixed with bentonite (a natural clay). Additives are used to control the viscosity and density of the mud. These additives include xanthan gum and starch and cellulose derivatives for viscosity control and solid barium sulfate for density control. The drilling mud is recycled during drilling and the rock cuttings are separated

from the mud on shaker boards. Drilling muds are processed with activated carbon and reused.

If the rock cuttings consist of environmentally benign rock types, they can be disposed of in landfills. This is a practical and economical way to dispose of solid waste materials that can be used in most cases. However, cuttings may be classified as hazardous depending on the concentration and potential for leaching of silica compounds, chlorides, arsenic, mercury, vanadium, nickel, and other heavy metals. In such cases, cuttings need to be disposed of appropriately.

Oil based drilling mud should not be used in geothermal drilling in RSM. Cuttings from oil-based drilling mud are of much greater environmental concern due to the content of oil-related contaminants. In the unlikely case where oil-based drilling mud would be used for geothermal drilling, it may be necessary to apply special on-site or off-site treatment before disposal.

c) Groundwater

Potential impacts on groundwater during the different phases of a geothermal project can range from low to high. Survey activities would typically have little or no impact on groundwater. If geothermal drilling is carried out according to best practices regarding use of drilling fluids and well casing, it is very unlikely that geothermal water can contaminate ground water aquifers. However, casing failures in either production or reinjection wells may create pathways for geothermal fluids to mix with groundwater at shallow levels. The depth of the casing leak will determine whether the geothermal fluids will flow out of the well or groundwater will flow into it. Casing leakages will, in both cases, reduce the productivity of the geothermal wells and may degrade the quality of shallow groundwater aquifers. If important freshwater aquifers overlie geothermal reservoirs that are under production, it is important to install monitoring wells to monitor ground water composition and temperature. It is particularly important to ensure that well casings are leak proof in wells that undergo acid treatment for mineral deposit removal.

Extracting geothermal fluids could also cause drawdowns in connected aquifers, potentially affecting flow from geothermal springs. The potential for these types of adverse effects is moderate to high, depending on the hydrological conditions. This impact can be reduced through extensive aquifer testing and proper geothermal development planning. Monitoring wells should also be opened to monitor water levels. In terms of the quantity of resource, cumulative impacts that are caused by multiple producers using the same reservoir are important and should be taken into consideration when there are two or more geothermal projects in the same geothermal reservoir.

d) Surface water sources

Impacts on water resources during the different stages of project development would range from low to high. Surface exploration activities would have little or no impact on surface water.

Temporary impacts on surface water may also occur because of the release of geothermal fluids during well testing if they are not contained. Geothermal fluids are hot and often highly mineralized and, if released to surface water, could cause thermal changes and changes in water quality. Accidental spills of geothermal fluids could occur due to well blowouts during drilling, leaks in piping or wellheads, or overflow from sump pits.

Additionally, surface or groundwater use can be necessary during exploration, well drilling and facility operation. Furthermore, depending on the operation facility, water can be used in the cooling system.

Surface and groundwater quality may also be adversely affected due to direct discharge of wastewater. Treatment or connection to municipal network should thus be made where necessary.

e) Solid Waste

Geothermal exploratory drilling projects do not generate substantial amounts of solid waste. Apart from drilling mud, other wastes produced by drilling include used oil and filters, spilled fuel, spent and unused solvents, scrap metal, pipe dope, etc.

Similar waste will be produced during construction (including capacity drilling) and operation of a geothermal project. Sulfur, silica, and carbonate precipitates are other typical wastes collected from cooling towers, air scrubber systems, turbines, and steam separators.

Domestic solid waste, packaging waste, non-hazardous wastes (e.g. paper, plastic, and glass) can be generated as well. These types of waste can also result in deterioration of soil and groundwater quality unless they are stored separately and disposed of properly.

f) Noise

Primary sources of noise associated with exploration and drilling wells include drill rig operations, seismic surveys, blasting, earth-moving equipment (related to road, well pad, and sump pit construction), and vehicle traffic.

g) Air emissions

Presence and concentration of potential air pollutants varies depending on the characteristics of the geothermal resource. Some of the toxic air pollutants such as hydrogen sulfide and mercury can be contained in geothermal fluids. Besides these chemicals, geothermal fluids can also contain environmentally sensitive gases such as carbon dioxide and methane. Release of these gases can lead to occupational health and safety problems, especially in confined spaces within power plants and wellhead cellars and during initial discharge. However, depending on the chemical characteristics of geothermal resource, release of these gases can lead to major air emissions and corresponding impacts. Greenhouse gas (GHG) emission from geothermal projects is commonly smaller as compared to fossil fuel combustion sources. Some geothermal fields can, however, have high GHG emissions because of specific geological conditions.

During preparation of the Project, it became clear that geothermal power plants located in the Menderes and Gediz Grabens in Türkiye have relatively high CO₂ emission factors. Assessments based on nine active geothermal plants in the Aegean region show emissions ranging from 400 to 1,300 g/kWh, with a weighted average of 1050 g/kWh.²⁴ These values are about an order of magnitude higher than the global average emission factor for geothermal power plants, 122 g/kWh²⁵. This is a result of the unique and unusual geological setting of the Türkiye's Aegean region geothermal systems, where high temperatures are present in carbonate rock dominated geology. Likely, based on available data, this problem will not arise to a similar extent outside of those two grabens. Since geothermal is largely considered a non-CO₂ emitting renewable energy source, there are currently no regulations in Türkiye that constrain CO₂ emissions from

²⁴ Aksoy N., "Power generation from geothermal resources in Turkey", Renewable Energy, vol. 68, 2014.

²⁵ Bertani R., Thain I. "Geothermal power generating plants, CO₂ emissions survey", IGA News, 49, 2002.

geothermal power plants and developers are not required to monitor or report their gas emissions either. However, facilities to capture geothermal CO₂ are already installed at three power plants in the Menderes Graben, with the gas being sold to the food and beverage industries.

Air emissions can occur during well drilling and flow testing activities. The open contact condenser / cooling tower systems is another source of air emissions during operation of the power plant. Well-field and plant-site vent mufflers can also be potential sources of hydrogen sulfide emissions, primarily during upset operating conditions when venting is required.

h) Well blowouts and pipeline ruptures

Although not common, well blowouts can occur during the drilling and operation stages of a geothermal project. These accidents can cause release of toxic fluids containing chemicals and heavy metals, and gases (i.e., hydrogen sulfide). Pipeline ruptures can also occur during drilling and operation. Such failures may also result in precipitation of minerals (silica and calcium carbonate) and release of geothermal liquid and steam containing heavy metals, acids, and other pollutants into the surface environment.

i) Natural resources and natural habitats

In general, impacts on ecological resources can be low to moderate and localized during exploration, drilling and plant operations. Activities such as site clearing and grading, road construction, well drilling, ancillary facility construction, and vehicle traffic have the potential to affect ecological resources by disturbing habitat, increasing erosion and runoff, and creating noise at the project site.

Depending on the project location, critical and natural habitats may be important concern in terms of project impacts and a major constraint for site selection.

j) Land use

In general, impacts on land use due to geothermal activities are temporary and localized. These activities could create a temporary disturbance in the immediate vicinity of surveying or drilling sites. The magnitude and extent of impacts from constructing access roads would depend on the current land use in the area. All other uses of land under well pads would be precluded as long as they are in operation. Surface exploration activities are unlikely to affect mining, energy development activities or livestock grazing on surrounding lands.

Land clearance and stripping may result in loss of vegetation and topsoil. Hence, good management practices should be implemented to minimize such impacts, and reinstatement should be made where necessary. Loss of vegetation and significant alteration of topography during excavation for site leveling may cause soil erosion and transport of soil into surface water bodies. The latter may result in increased turbidity and hence poor aquatic habitat quality.

k) Well abandonment

At the end of operation of a well or if a well fails to provide thermal groundwater, well should be closed with concrete. This will protect other aquifers and living things from adverse impacts of hazardous gases and other hazardous substances that may originate from wells.

l) Cultural resources

Geothermal development activities may cause impact on physical cultural resources known to be of local, regional, or national significance based on proposed national or provincial lists identified during public consultation with local affected groups.

m) Expropriation

From a social point of view, development of geothermal resources may involve occupation of large areas depending on the scale of project (i.e. number of wells, length of pipelines, and size of power plant and separator stations). Hence, a land acquisition process is implemented. Where the project area is not government property, expropriation is required, which may be among the major impacts associated with geothermal development, like other energy generation investments.

n) Other social impacts

The construction period may create impacts on the current infrastructure such as roads and irrigation. Also, access to public services may be limited in case road infrastructure is damaged especially during construction of pipelines. There may be also population influx to project area and creation of new job opportunities and increase in local economic livelihoods. Positive aspects of geothermal development projects may be enhanced by providing services to nearby communities. These include providing heating to the nearest settlements and/or industries or farms.

o) Occupational Health and Safety

Major health and safety issues in geothermal projects comprise the potential for exposure to i) geothermal gases; ii) confined spaces; iii) heat; and iv) noise. In addition, the use of acids for well cleaning should be conducted by taking all precautionary measures and by using protective equipment. Storage of these substances at the site should be done according to hazardous waste control regulations.

p) Community Health and Safety

Major community health and safety issues in geothermal projects include i) exposure to geothermal gases; ii) facility safety; iii) impacts on water resources; and iv) traffic safety.

Table 22 summarizes the possible environmental and social impact during geothermal exploration activities.

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Description of Mitigation Options

Table 22 – Environmental and social issues and related mitigation measures for drilling activities

Environmental & social issue	Possible Impacts	Mitigation Measures
Effluent discharge	<ul style="list-style-type: none"> Discharge of drilling fluids including extracted water from exploration and operational wells during testing. Discharge of extracted water during well testing. Cleaning Water Discharge of domestic wastewater from camp site 	<ul style="list-style-type: none"> Storage of drilling fluids in a storage tank or sumps. If an earth-based pond/sump is used for the storage, pond/sump should be lined with an impervious membrane Reuse of drilling fluids where possible Depending on chemical characteristics of drilling fluids, discharge to a receiving body. Discharge should comply with pertinent regulations and World Bank Group EHS Guidelines Removal of sumps or tanks to eliminate future release and contamination Storage and disposal of domestic wastewater in line with related regulations. Water-based drilling fluids can be reinjected into drilling well following to toxicity assessment. Excessive drilling fluids, wastewater remaining on the top of the mud pond (if its quality is not appropriate for reuse) shall be sent to treatment plant via sewage trucks for proper disposal.
Drilling Mud	<ul style="list-style-type: none"> Storage and disposal of drilling mud including cuttings 	<ul style="list-style-type: none"> Disposal of drilling mud depending on chemical characteristics. Storage of drilling mud in a pit covered with membrane or in a concrete pit to provide impermeability Transfer, treatment and disposal of mud in accordance with the Waste Management Regulation, also if the mud classified as hazardous. Design of geothermal mud ponds to be covered with appropriate membranes – oil based (high density) and water-based muds (low-density).
Groundwater	<ul style="list-style-type: none"> Contamination of fresh groundwater resources in case of percolation of thermal groundwater during drilling and testing. 	<ul style="list-style-type: none"> Preliminary impact analysis and related mitigation measures (i.e., double casing) depending on literature survey about aquifer structure and groundwater use at exploration area as a part of PIF or EIA prepared in accordance with EIA Regulation. Existing Groundwater users in the vicinity of the exploration well(s) (e.g. 1 km) can be identified. In addition, some of technical information about existing groundwater wells (e.g. depth, flow, etc.) can be collected.

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Environmental & social issue	Possible Impacts	Mitigation Measures
		<ul style="list-style-type: none"> Proper well casing and well casing material selection for groundwater aquifer section(s).
Solid and Hazardous Waste	<ul style="list-style-type: none"> Storage and disposal of solid and hazardous waste. 	<ul style="list-style-type: none"> Hazardous waste, waste oil, used accumulators and batteries, electrical and electronic wastes, recyclable wastes, domestic waste, medical wastes, etc. should be classified, separately stored, and disposed in accordance with pertinent regulations and World Bank Group EHS Guidelines
Noise	<ul style="list-style-type: none"> Seismic studies, drilling rig, generators, traffic, etc. 	<ul style="list-style-type: none"> Time work to minimize disturbance Use appropriate construction methods & equipment Restrict through-traffic in residential areas Careful siting and/or design of plant, provide noise barriers e.g. embankments of waste soil Noise modelling studies may be conducted before execution of drilling activities considering sensitive receptors to plan proper mitigation measures.
Air Emissions	<ul style="list-style-type: none"> Possible toxic gas emissions during drilling and well testing (hydrogen sulfide, mercury, etc.) Dust emission due to site activities, arrangement of drilling rig area, construction of access roads, traffic etc. 	<ul style="list-style-type: none"> Depending on the characteristics of the source, on site toxic gas measurements, (i.e., hydrogen sulfide) Appropriate design, training in O&M, safety Safety planning and measures for uncontrolled gas releases Control of dust with water suppression Timing of works, vehicle speeds Minimization of major works inside communities Preparation of NCG Mitigation Plan and H2S Management Plan
Natural Resources	<ul style="list-style-type: none"> Disturbance of natural habitats from construction, e.g. dust, noise, un-seasonal working, poor siting of new works, disposal of untreated wastes, etc. 	<ul style="list-style-type: none"> Careful siting, alignment, design of rig sites, and/or timing of works (seasonal) Selection of proper disposal areas and methods in line with related regulations Protect sensitive areas within/close proximity to site, defined in national legislation, international conventions, and Key Biodiversity Areas (KBAs) Avoid adverse impacts on natural/critical habitats defined in OP 4.04 and prepare Biodiversity Management Plan and implement Flora-fauna monitoring if necessary Tree cutting should be minimized

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Environmental & social issue	Possible Impacts	Mitigation Measures
		<ul style="list-style-type: none"> Mud ponds should be constructed away from aquatic environments – ponds should be kept covered or fenced to prevent fauna species from entering.
Land Use and Soils	<ul style="list-style-type: none"> Loss of topsoil during preparation of rig sites, construction of access roads or disposal of excavated materials Damage to soil structure due to material storage, traffic, etc. Erosion due to uncontrolled surface run-off where vegetation is cleared Landslips on embankments or hillsides 	<ul style="list-style-type: none"> Stripping topsoil where necessary, store separately and replace post construction Protection of non-construction areas Avoiding work in sensitive areas in case highly adverse conditions Providing temporary haul roads as appropriate Restoration of damaged areas Design of drainage and other disposal facilities to ensure soil stability and appropriate treatment Design of slopes & retaining structures to minimize risk, provide appropriate drainage, soil stabilization/vegetation cover Take/dispose of materials from/at approved sites via the Soil erosion management plan
Well Blowouts	<ul style="list-style-type: none"> Well blowout during drilling 	<ul style="list-style-type: none"> Design of emergency response for well blowout including measures for containment of geothermal fluid spills through Emergency Preparedness and Response Plan Spill prevention control plan including control strategies for fuels, oils, etc. used during drilling & testing Implementation of good drilling practices such as appropriate project planning, good design, appropriate personnel training, and right selection of blow out equipment and standards to avoid well blow outs
Water Resources	<ul style="list-style-type: none"> Possible overflow from mud pit. Discharge of test water. Contamination/pollution of resource, drilling chemicals, fuel & oil, hazardous wastes, wastewater, etc. 	<ul style="list-style-type: none"> Determination of sustainable use/yield (test as required) in order to assess impact on neighboring projects. Resource planning and management, in conjunction with authorities & communities Careful design – maintaining of natural drainage where possible, provide suitable wastewater drainage, safe/sanitary disposal of hazardous wastes

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Environmental & social issue	Possible Impacts	Mitigation Measures
		<ul style="list-style-type: none"> For the projects which apply to FIs for power plant construction and operation, the FI will make sure that company fully complied with this ESMF and national regulations (drill mud disposal, test water discharge, etc.) during exploration drilling and capacity drill (test) phase.
Social Components	<ul style="list-style-type: none"> Concerns and complaints of affected communities Land acquisition/expropriation process Ex Post Social Audit, Resettlement action plan 	<ul style="list-style-type: none"> Consultation on risks and adverse impacts of the project and creation of opportunities to receive affected communities' views on project via stakeholder engagement plan Establishment of grievance mechanism to collect and facilitate resolution of affected communities' concerns and grievances regarding the Beneficiary's environmental and social performance. Transparent public disclosure to inform each phase of the project through web site, notice boards, telecommunication tools and public meetings. Establishing well designed and structured public questionnaire to receive feedback from affected communities. Compensating for any land or land-based livelihood loss through relevant E&S documents prepared for the purpose
Aesthetics and Landscape	<ul style="list-style-type: none"> Local visual impact of completed works and some intrusions into general manmade and natural landscape, loss of trees, vegetation, etc. Noise, dust, wastes, etc., during drilling operations 	<ul style="list-style-type: none"> Careful siting and design of works, screening of intrusive items with soft landscaping, where possible Replantation and afforestation. Careful de-commissioning of drilling rig areas and disposal of wastes
Occupational Health and Safety	<ul style="list-style-type: none"> Toxic gas emissions during drilling Non-routine exposures include potential blowout accidents during drilling 	<ul style="list-style-type: none"> Installation of hydrogen sulfide monitoring and warning systems plus seismic monitoring system Development of a contingency plan for hydrogen sulfide release events, including all necessary aspects from evacuation to resumption of normal operations

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Environmental & social issue	Possible Impacts	Mitigation Measures
	<ul style="list-style-type: none"> physical risks i.e. noise-vibration 	<ul style="list-style-type: none"> Provision of an emergency response teams, and workers at drilling rig, with personal hydrogen sulfide monitors, self-contained breathing apparatus and emergency oxygen supplies, and training in their safe and effective use Provision of adequate ventilation of occupied buildings to avoid accumulation of hydrogen sulfide gas Providing workers with a fact sheet or other readily available information about the chemical composition of liquid and gaseous phases with an explanation of potential implications for human health and safety Shielding surfaces where workers come in close contact with hot equipment, including generating equipment, pipes etc. Use of personal protective equipment (PPE) as appropriate, including insulated gloves and shoes Implementing appropriate safety procedures during the exploratory drilling process Development of a site-specific Occupational Health and Safety (OHS) risk assessment and respective OHS Management Plan and training of personnel regarding the risks
Human Health	<ul style="list-style-type: none"> Toxic gas emissions during drilling Unauthorized site access to drilling rig. Hazardous chemicals may accumulate in ponds where reject thermal water to be re-injected to reservoir is collected 	<ul style="list-style-type: none"> Installation of hydrogen sulfide monitoring and warning systems Siting of potential significant emissions sources with consideration of hydrogen sulfide gas exposure to nearby communities (considering key environmental factors such as proximity, morphology and prevailing wind directions) Continuous operation of the hydrogen sulfide gas monitoring systems to facilitate early detection and warning Fencing around well sites, open ponds and mud pits Emergency planning involving community input to allow for effective response to monitoring system warnings
Historical / Cultural Sites	<ul style="list-style-type: none"> Disturbance/ damage/ degradation to registered and undiscovered sites 	<ul style="list-style-type: none"> Careful siting/alignment of works; special measures to protect known resources/areas Immediately halt work in vicinity of discoveries, pending instructions from relevant museum directorates (implementation of "Chance Find" procedure)

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Environmental & social issue	Possible Impacts	Mitigation Measures
Coronavirus pandemic	<ul style="list-style-type: none"> Negative impacts on the community's health Increased pressure on healthcare infrastructure 	<ul style="list-style-type: none"> Providing surveillance and active screening and treatment of workers Developing and designing an appropriate site-based medical service Conducting trainings for employees on prevention from pandemic Conducting immunization programs for workers in local communities to improve health and guard against infection Providing worker education on coronavirus Getting Medical clearance required for return to work for all employees diagnosed with coronavirus Conducting track and trace investigation in accordance with coronavirus control program Provide medical unit 24/7 service on the site Project to notify Government of coronavirus cases (Government to follow up with family members of workers diagnosed with coronavirus as part of national coronavirus program)

Within the scope of Cumulative Impact Assessment (CIA) Report developed for Türkiye geothermal resources, some amendments have been proposed for environmental and land acquisition/expropriation related legislation by considering international standards, legislation, guidelines, and good practices. It is expected that these recommendations will be taken into consideration by relevant authorities and official process will be completed for the amendments.

3. The Turkish Regulation on EIA

The Regulation on Environmental Impact Assessment (henceforth "EIA Regulation") (Official Gazette No. 29186, November 25, 2014) governs environmental impact assessment of investment projects in Türkiye. This is largely in line with the EU Directive on EIA. Below, the key relevant steps of Turkish EIA procedure, namely screening, public consultation, scoping, disclosure, and supervision are reviewed briefly in the order in which they are prescribed to occur.

a) Screening:

The EIA Regulation classifies projects into two categories

- *Annex I projects.* These are projects that have significant potential impacts and *require* an EIA. Annex I of the EIA Regulation lists these projects types, where project proponents are expected to start the EIA procedure without any other screening process.
- *Annex II projects.* These are projects that may or may not have significant effects on the environment. Annex II of the EIA Regulation lists these projects types. Proponents of Annex II projects are required to submit a Project Information File (PIF) to PDEU. The PIF is prepared following the General Format for PIF provided in Annex IV of the EIA Regulation and contains information on (i) project characteristics; (ii) Project site and existing environmental characteristics of the impact area; and (iii) significant environmental impacts of the project during construction and operation phases and measures to be taken. A non-technical summary of the above items is also to be added to the PIF. Based on the PIF and the Selection and Elimination Criteria specified in Annex IV of the EIA Regulation, PDEU determines whether an EIA is necessary or not.

Table 23 lists the various stages of geothermal project development and their category according to the EIA Regulation.

Table 23 – Project Types and their Categorization According to Turkish EIA Regulation

Investment Area	Annex I	Annex II
Exploration (surface and drilling) of Geothermal Resources	-	Mine, petroleum, and geothermal resource exploration projects (except seismic, electricity, magnetic, electromagnetic, geophysics, etc. methodologies)
Early Geothermal Development Financing Mechanism	Discovering or producing geothermal resources for electricity generation (installed capacity of 20 MW _e and above).	Producing geothermal resources for electricity generation (installed capacity of 5 MW _e and above).

Source: Republic of Türkiye , Regulation on EIA (Official Gazette No. 29186, November 25, 2014)

b) Public consultation meetings

For projects that require the preparation of an EIA, the Governorate is required to inform the public that a project application has been submitted in a specified locality, that the EIA process has begun and that the public may submit its comments and suggestions to the Governorate or MEUCC. The announcement is made using a variety of methods, including the internet, bulletin boards and loudspeaker announcements. MEUCC informs the public of the same through the internet.

A formal public consultation meeting occurs for projects that are subject to an EIA after the screening process and prior to scoping. The project proponent organizes a “public-participation meeting” chaired by a MEUCC’s provincial director in a location that affected local groups can access easily. The invitation to the meeting is published in a national and a local newspaper at least ten days prior to the meeting. There is no requirement that information on the project should be provided to the public, except for the subject matter of the meeting, in advance. However, the EIA Regulation specifies that during the meeting, which is chaired by the Director or a member of MEUCC’s provincial directorate, it should be ensured that the public is informed about the project, and its comments and suggestions regarding the project are obtained. The meeting chairperson may request comments in writing too. Minutes of the meeting are kept and submitted to MEUCC and the Governorate. The Governorate is required to inform the public about the timeframe for submission of public comments and suggestions. Such comments and suggestions are submitted to the EIA commission.

For Annex II projects, which are subject to preliminary environmental impact assessment via a PIF, there is no public participation process.

c) Scoping:

The project proponent presents a project dossier (EIA application file using the EIA outline (Annex III of the EIA Regulation) for Annex I projects) to a commission, which comprises of representatives of MEUCC and relevant organizations as identified by MEUCC. Based on the information submitted, the commission determines the scope of the EIA and issues the “project specific format” for the EIA report to be prepared considering the “general format” used for the application file. The commission may exclude or include some items to the format depending on the specific characteristics of the proposed project. The commission also determines the level of detail under each heading depending on the special project’s environmental impacts. In this process, the commission takes the opinions expressed during the public participation meeting into consideration.

d) Review and approval of the EIA report

As mentioned previously, the commission revises the draft version of the EIA report. In its review, the commission assesses (i) the adequacy of the EIA report and its annexes; (ii) whether the analyses, evaluations or calculations were adequately substantiated by relevant data and documentation; (iii) whether the potential environmental impacts of the project were evaluated in adequate scope and depth; (iv) whether measures necessary to prevent or mitigate negative environmental impacts have been identified; (v) whether the public participation meeting was carried out in accordance with prescribed procedures and the issues brought up during the meeting were adequately addressed in the report. While the EIA identifies project’s environmental impacts and mitigation measures, it does not specify costs and institutional responsibilities associated with these mitigation measures. Neither does the EIA include a monitoring plan. The final EIA report, which incorporates the commission’s assessments, is then submitted to

the MEUCC for final review. MEUCC determines whether the “EIA is positive” in which case the project proponent may implement the project or “EIA is negative” in which case the project may not go forward.

e) Disclosure:

The draft EIA report is made available to the public for comments at Central MEUCC or provincial directorate. After MEUCC’s final evaluation of the EIA report, the Governorate announces to the public MEUCC’s decision together with its justifications. Disclosure of the final EIA document is not explicitly foreseen in the EIA Regulation but made available to the public via the internet in the current implementation.

f) Monitoring and inspection:

According to the EIA Regulation, MEUCC monitors and inspects projects that were assessed to be either “EIA not required” or “EIA is positive” based on provisions specified in the PIF or the EIA, respectively. Furthermore, the project proponent is obliged to submit project progress reports to MEUCC for the activity where “EIA is positive” decision was issued through electronic system and made it available for the inspections. (The form of this disclosure is not specified in the EIA Regulation.) In case MEUCC determines non-compliance, the Governorate issues a warning. If after the granted time compliance is still not achieved the Governorate may suspend the operation of the plant or facility in question.

4. The WB Environmental Assessment Policy

The WB approach to EIA is explained below.

a) Project categories and screening

Under OP 4.01, projects are classified under Categories A, B and C according to the level of their likely impact on the environment:

- *Category A.* A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts (based on type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts). These impacts are generally large-scale, irreversible, sensitive, diverse, cumulative, or precedent setting and may affect an area broader than the sites or facilities financed by the project. For example, Category A projects have one or more of the following attributes: large-scale conversion or degradation of natural habitats; extraction, consumption, or conversion of substantial amounts of forest, mineral and other natural resources; direct discharge of pollutants resulting in degradation of air, water or soil; production, storage, use or disposal of hazardous materials and wastes; measurable changes in hydrologic cycle; risks associated with the proposed use of pesticides.
- *Category B.* A proposed project is classified as Category B if the potential impacts on the environment are typically site-specific, reversible in nature; less adverse than those of Category A projects and for which mitigation measures can be designed more readily. Projects in Category B sometimes differ only in scale from Category A projects of the same type. For example, large irrigation and drainage projects are usually categorized as A; however, small scale projects of the same type may be categorized as B. The same can be true for small scale, relatively clean (gas or light diesel oil fired) thermal power plants, micro hydro power plants, and small sanitary landfills. Similarly, projects that finance rehabilitating or maintaining an existing infrastructure may have adverse

impacts, but are likely to be less significant compared to a Category A project, and would be categorized as B.

- *Category C.* A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. For example, technical assistance projects in institutional development, computerization, and training fall in Category C.

When a WB-funded project involves a series of subprojects, which are selected and funded by a financial intermediary (FI) using WB loan proceeds, the project is classified as Category FI. In such projects, the FI screens and classifies the proposed subprojects as Category A, B, or C following the above definitions and ensures that the Beneficiary carries out the corresponding environmental assessment. Since the RSM is an FI project, the following discussion will refer to subprojects only.

There are no clear-cut border values distinguishing the categories or, unlike the Turkish EIA Regulation, any ready lists of project types for categorizing projects as A, B and C; rather projects are screened on a case-by-case basis. RSM has been assigned as Category FI (Financial Intermediary) in accordance with WB safeguard policy OP/ BP/ GP 4.0 since TKYB has been assigned as FI for using WB loan proceeds. The RSM applications will be screened by FIs according to WB environmental safeguards and a consensus about final category will be reached with the WB.

b) Scope of environmental assessment

The scope and type of the environmental assessment (EA)²⁶ varies between Category A and B projects.

For Category A projects the Applicant is required to prepare an ESIA which examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. ESIA also includes an Environmental Social Management Plan (ESMP) which details the measures to be taken during the implementation and operation of a project to eliminate, reduce or offset adverse environmental impacts, the actions needed to implement these measures as well as monitoring indicators and actions and responsibilities (see Annex 12A for an ESMP format, and Annex 12F for ESIA format).

The scope of EA document for a Category B subproject may vary from subproject to subproject, but is narrower than the ESIA required for Category A. Like Category A ESIA, it examines the subproject's potential negative and positive environmental and social impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. If the project is recognized as B category, this information may be contained in an ESMP only, unless there are site-specific issues which necessitating a site-specific assessment in addition to the ESMP. An example is modest scale building construction on a site in an urban area which would normally require only an ESMP if it is known that there are no major E&S issues relating to the site. The project could turn into Category A if EIA work shows likelihood of significant damage to natural habitat (Annex 12A provides a sample ESMP format for applications to the RSM).

²⁶ "Environmental assessment" is used as a general term here.

c) Public consultation

For all Category A and B projects proposed for RSM support, during the EA process, the Applicant consults project-affected groups and NGOs about the project's environmental aspects and takes their views into account.

For category B projects, at least one consultation is held with affected groups and local NGOs: once the draft EA report (including ESMP) is prepared. The Applicant provides a summary of the EA's conclusions. (Please also refer to "g) Disclosure" below).

In addition, the Applicant consults with such groups throughout project implementation as necessary to address EA-related issues that affect them.

For meaningful consultations between the Applicant and project-affected groups and local NGOs on all Category A and B projects proposed under RSM, the Applicant provides relevant material (in Turkish) in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted.

d) Expert selection

For Category A subprojects, WB reviews and clears the 'table of contents' of the ESIA. If needed, WB can help to prepare the TOR for the ESIA consultant. Furthermore, such experts must be independent from the project proponent and not affiliated with the project. For Category B Projects, the Beneficiaries may either select consultants designing the Project or staff of the Project proponent to carry out the ESMP. The FI of the Project will be responsible for monitoring and guiding the process.

e) Review and approval of the ESMP

In FI projects, the responsibility to ensure that OP 4.01 requirements are shared between Applicant, FI, and the WB. FI is the responsible agency to review and assess the Applicant to meet the conditions as set out in this BM. WB provides overall supervision and also "no objection". The EA process should normally be completed prior to the FI's approval of a project under RSM.

f) Conditionality

In FI projects, the sub-loan agreement between FI and the Applicant must include the conditionality for the Applicant to implement the relevant EA document (EIA, ESMP, etc.) for Category A and B subprojects. The Applicant must monitor and ensure that the contractor is in compliance with the provisions of the EA document. In order to fulfill its environmental and social obligations, the Applicant will incorporate provisions of the EA document into the procurement documents and contracts for works. Non-compliance may lead to the suspension of WB support for the subproject.

g) Disclosure

In addition to the disclosure requirements specified under "c) Public consultation" above for Category A subprojects, the FI must make the draft EIA report available in Turkish at a public place accessible to subproject-affected groups and local NGOs.

When the EIA of a Category A subproject is finalized, the FI transmits to WB an English language copy of the final report including an English language executive summary. The WB distributes the executive summary to its executive directors and makes the report available through its external website.

In case of Category B subprojects, the ESMP is disclosed in country in Turkish and after finalization FI transmits to WB the final English language of the report. Then, WB makes it available through its external website by indicating the in-country disclosure date.

h) Implementation

During project implementation, the FI reports to WB on (a) compliance with measures agreed with the WB on the basis of the findings and results of the EA, including implementation of the ESMP; and (b) the findings of monitoring programs. The WB bases supervision of the project's environmental and social aspects on the findings and recommendations of the EA, including measures set out in the legal agreements, any ESIA/ESMP, and other project documents.

5. Key differences between Turkish EIA Regulation and WB OP 4.01 Policy

Key differences are as follows:

a) Project categorization.

WB assumes the exploration stage of the RSM as Category B. It is assumed that the heating, SPA like facilities will again fall into Category B. However, some of the energy production facilities (power plants) may be categorized as 'A' according to environmental and social risks. Turkish regulation classifies geothermal energy generation facilities as Annex I if the installed capacity is larger than 20 MW_e. The WB will categorize projects on a case-by-case basis, therefore the FI will consult with WB for the categorization of such an application and follow relevant procedures for environmental and social assessment based on the agreed category.

b) EIA expert selection.

There are no clauses in the Turkish EIA Regulation limiting expert eligibility to prevent conflict of interest.

c) EA content.

Category A subprojects. A broad comparison of the outline required by WB for a Category A subproject EIA with the general format of a Turkish PIF indicates a number of differences. These include notably the absence of an executive summary and information on the policy, legal and administrative framework, as well as possible discrepancies with regard to the level at which the subproject's environmental impacts, its alternatives, and mitigation measures for the impacts are discussed. A key gap is the absence of an ESMP with clear specification of actions and delineation of responsibilities. Nevertheless, the project specific format for EIA may require more details under some of these headings than indicated in the general format for PIF. Consequently, a case-by-case review of the Turkish EIAs is necessary to identify gaps with WB requirements.

Category B projects. The content of the EA required by WB depends on the special circumstances of the project. In all cases, an ESMP is required which is only partially covered in a Turkish EIA. The level of assessment in the ESMPs will be evaluated on case-by-case basis. There is no corresponding category in Turkish EIA Regulation for Category B classification.

6. Application of the Turkish EIA Regulation and WB EIA Policy

In the light of the similarities, the procedures to be carried out for meeting the WB OP 4.01 requirements will be designed to avoid repeating the same steps of Turkish EIA process. These procedures will be supplementary to the Turkish EIA process that have already been carried out. The following section lays out the procedures in a step-by-step manner.

Step 1: Screening

The Environmental and Social Management Framework (ESMF) prepared by the client will be disclosed within the country and then WB will share it via its external website before project appraisal (30 days in advance). The locations and the scope of the objectives will be identified during the Project implementation and relevant environmental and social assessment documents will be prepared according to WB OP 4.01 requirements.

The FI, in consultation with WB, will carry out the screening of subprojects in terms of Category A, B or C. For the projects which will be screened by the RSM consultant (with the supervision of RSM Unit) it is assumed that all of them will fall into Category B since they will only include drilling for exploration (generally 1-3 wells). It is assumed that on exceptional basis, the subprojects that will be screened by RSM Unit may fall into Category A if assessed to carry "high risk". Still, most of the subprojects under RSM (capacity drills and heating, SPA, energy generation facilities) will be classified as Category B.

As it is described above, Category B covers any project which is not sufficiently complex and risky to require a full, comprehensive ESIA (addressing a wide range of potential issues and including up-to-date environmental baseline data and a detailed analysis of alternatives) but does require some analysis of potential environmental impacts in order to be able to identify appropriate mitigation measures and monitoring indicators. According to the significance of the limited impacts of Category B projects different types of EA documentation could be required. The FI will assess whether the impacts are more significant than a low risk (C) project and then an ESMP will be asked for.

The natural habitats policy is triggered for the project to inform the EA process about detailed assessment of natural ecology if the project site (both for exploration, capacity drilling or energy generation facilities) is on or in the vicinity of a natural habitat. However, any project located in a critical natural habitat will be ineligible for RSM.

Regarding OP 7.50, FI is responsible for ensuring that the projects financed are located/depending on national waterways only. The waterways identified as NOT an international waterway (do not trigger OP 7.50) in Türkiye are: Susurluk, North Aegean, Gediz, Kuçuk Menderes, Buyuk Menderes, Western Mediterranean, Antalya, Sakarya, Western Black Sea, Yesilirmak, Kizilirmak, Konya Kapali, Eastern Mediterranean, Seyhan, Ceyhan, Eastern Black Sea, Burdur, Afyon, Orta Anadolu, and Van.

In addition to the river basins, there are three transboundary aquifers in Türkiye. The first, known as "Svilegrad/Orestiada" is in the northern border area between Bulgaria-Greece and Türkiye. The second, known as "Evros/Meric" is along the Greece-Türkiye border while the third, known as the "Topolovgrad karst waterbearing massif" is on the Bulgaria-Türkiye border. These lie along the northern borders of Türkiye along the areas highlighted in yellow in the extracted map below. Drilling activities should also avoid

these aquifers and the main responsible party for ensuring this is the relevant FI of the project application.

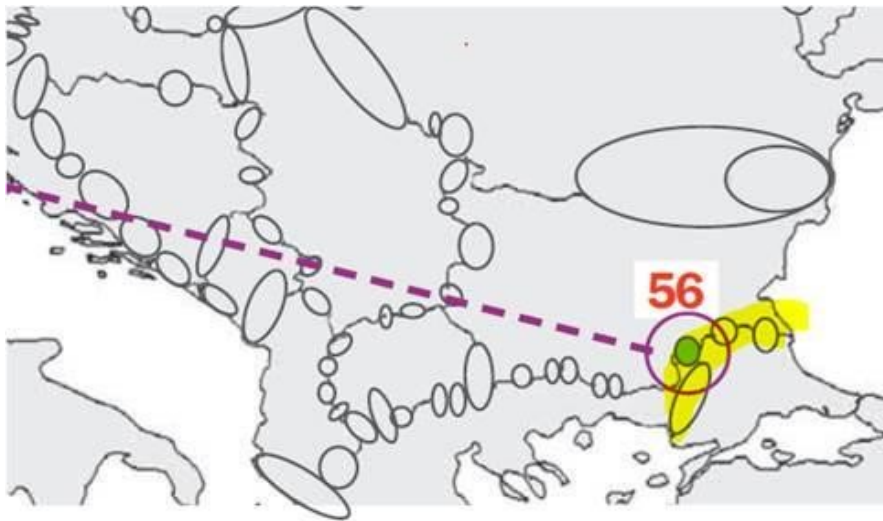


Figure 20 – Three transboundary aquifers in Türkiye

Step 2: Environmental Assessment

Category A Subprojects

For Category A projects, if a Turkish EIA was not prepared (either because the subproject was listed in Annex II or not deemed to need an EIA or it was not listed in either Annex I or Annex II) a full ESIA following WB guidelines will have to be prepared. If a Turkish EIA was prepared, then FI will carry out a gap analysis of the information and analysis provided to determine the content of the supplementary documents. If the nature of the missing information is minor, i.e. the information gap concerns only policy, legal and administrative framework; baseline information; or minor discrepancies in project description, but all other requirements as listed in Annex 10A, including ESMP, are met, then supplementary documents will contain only this information. If the information gap concerns the depth and scope of discussion on environmental impacts, mitigation and monitoring measures and arrangements; project alternatives, it is considered major, and will require in depth documentation of these issues, including an ESMP. In both cases, the “WB ESIA” will consist of supplementary documents and the Turkish EIA. It should be noted that evaluating cumulative impacts is a part of Category A ESIA process.

Category B Subprojects

If the project is recognized as B, then an ESMP is required to satisfy the expected requirements, where its scope will be determined on a case-by-case basis. For subprojects that are listed as Annex II according to Turkish EIA Regulation, there is a PIF and the PIF likely has information on the mitigatory measures but no details on their costs and the institutions designated to carry them out or a detailed monitoring plan. The PIF can be used as a background document while preparing the ESMP.

Completing a satisfactory ESMP is the responsibility of the Beneficiaries. FI will perform an overall quality assurance function that the documents prepared meet WB requirements. In reviewing an ESMP, FI will also confirm that it is clear, feasible and appropriate.

Step 3: Public Consultation

Category A Subprojects

The number and content of public consultations in Category A projects will depend on whether a Turkish EIA was carried out and the compatibility of the Turkish EIA report with WB requirements. If a Turkish EIA was not carried out, at least two public consultation meetings will be carried out, namely one to discuss the TOR and a second one to discuss the draft ESIA report.

In cases where the Turkish EIA has major information gaps relative to WB requirements, also at least two public consultation meetings will be held. The first meeting will be on the ESIA TORs for the proposed supplementary documents. The second meeting will be held when the supplementary environmental assessment documents are in draft form; at this meeting both the draft supplementary documents and the Turkish EIA will be discussed. In contrast, in cases, where the information gap between the Turkish EIA and the WB requirements is minor, a public consultation meeting will be carried out when the draft supplementary documents are available and discuss the entire WB EIA package.

Category B Subprojects

A public consultation meeting will be held for Category B subprojects at the draft EA stage whether or not PIF is available. This is because the Turkish EIA Regulation does not require public consultation for projects that are not included in Annex 1 of Turkish EIA regulation, whereas WB policy (OP 4.01) requires at least one consultation meeting for Category B.

Public consultations will be widely announced at least two weeks in advance of the meeting, using local newspapers and other local means of information dissemination that are known to be effective. For both Category A and B projects, the Beneficiaries will ensure that draft ESIA and ESMPs and other assessment or supplementary documents are available in public places and meeting announcement will point out the location. The minutes of public meetings will be recorded and included in the ESIA/partial ESIA/ESMPs of subprojects. Annex 12E provides a table of contents for the public consultation documentation.

It is also important to inform local people about the methodology of land acquisition (expropriation, urgent expropriation, willing buyer willing seller procedures, etc.) during public consultations. However, local people should be informed that the public participation meeting is not the venue for individual discussions on compensation amounts, etc. Therefore, the overall methodology of the land acquisition methods, the timeframe assumed for this phase and the contact point from Applicant's site should be presented.

Step 4: ESIA Expert Selection and TOR

For Category A subprojects, WB reviews and clears the 'table of contents' of the ESIA. If needed, WB can help to prepare the TOR for the ESIA consultant. Furthermore, such experts must be independent from the project proponent and not affiliated with the project. For Category B Projects, the Beneficiaries may either select consultants designing the Project or staff of the Project proponent to carry out the ESMP. The FI of the Project will be responsible for monitoring and guiding the process.

Step 5: WB Clearance

The WB will review and provide no objection to all projects assigned as "Category A" in accordance with WB procedures before a final decision to fund the subproject can be taken by FI.

In case of Category B subprojects, the first two subprojects will be submitted to WB for review and clearance. Assuming the ESMF is being implemented by the FI satisfactorily; the next Category B subprojects will be reviewed and cleared by the FI. WB will conduct post-review for the Category B subprojects.

It should be noted that for all subprojects, FIs will consult WB for proper environmental risk categorization according to OP 4.01.

Step 6: Incorporation in Works Contracts

Sub-loan agreement must include requirement to implement the ESMP. The ESMP and other supplementary documents will also be attached to the procurement documents and be part of the contract with the contractor selected to carry out the project works. These sections include potential impacts that may occur during the set of works in question and measures that the contractor needs to take to mitigate them.

Step 7: Information Disclosure

For both Category A and B projects, the Applicant will ensure that hard copies of the final Turkish language WB ESIA and ESMPs are available in a public place.²⁷ FI will post the final documents on its website. In case of Category A subprojects and the first two Category B subprojects disclosure in Türkiye must be complete before WB can provide the 'no objection' to their RSM application. In addition, the final ESIA report for Category A projects should be disclosed to the public during the second public participation meeting.

Prior to subproject approval, FI will also submit English versions of the final ESIA and ESMP documents to the WB for posting on its external website. In case of Category A subprojects, 30 days prior to subproject approval, FI will submit an English language executive summary of the WB ESIA report to WB for submission to the WB Board of Executive Directors.

Step 8: Monitoring

The FI of the project will carry out regular supervision of projects during construction and operation to ensure that the ESMP is being duly carried out. When FI notices any problems in ESMP implementation it will inform the relevant Beneficiary and agree with them on steps to rectify these problems. FI will report its findings to the WB in its biannual project progress report or more frequently, as needed to bring issues to the attention of the WB. The WB project team will on occasion, and as required, also visit project sites as part of project supervision.

Step 9: Compliance with other WB Operational Policies

Natural Habitats (OP 4.04). The exploration and capacity drilling activities may take place in rural areas that are potential natural habitats. According to OP 4.04 the projects which do not create any significant adverse impacts on natural habitats and that are not placed in critical natural habitats will be eligible for RSM support. Issues related to natural habitats will be detailed in the EA documents which will be prepared for RSM. It

²⁷ "WB EIAs and ESMPs" means original Turkish EIA and gap-filling supplementary documents.

should be noted that nationally protected areas as well as internationally protected areas are defined as critical habitats.

Physical Cultural Resources (OP 4.11). In any circumstances, whether or not the Project is located in historic areas, the ESMP will include procedures and responsibilities for managing accidentally discovered or chance find cultural artifacts.

Turkish laws, notably Law No. 2863 dated 21/07/1983 on the Protection of Cultural and Natural Assets (revised through the amendment issued on 27/07/2004 dated Official Gazette) and practices meet the WB requirements. The Regulation on Research, Drillings and Excavations in Relation to the Cultural and Natural Assets, which was published in the Official Gazette No. 18485 dated 10/08/1994 define the procedures and obligations concerning the cultural and natural assets found out during construction. FI is responsible to avoid or mitigate impacts on physical or cultural resources of the financed projects. Therefore, FI will not proceed with project funding until all requirements of the Turkish legislation are met. Since the national regulations on the conservation of cultural properties are strict, it is not anticipated that any additional requirements would arise for WB safeguards policies.

Involuntary Resettlement (OP 4.12) - According to Turkish regulation, all involuntary land acquisition is generally completed prior to signing the BA under RSM. The counterparts were informed however that even if the land acquisition is completed prior to RSM support, OP 4.12 applies if land was acquired in anticipation of or in preparation for a project shortly before initial discussions with the WB and the land is directly linked to the WB project. In such cases, the FI of the Project will need to conduct ex-post social audits to ensure that the land acquisition was completed in accordance with the objectives of OP 4.12, and in cases when necessary, the FI will develop a corrective action plan to bridge significant gaps.

In cases where additional involuntary land acquisition will be necessary, the Applicant under the supervision of FI will be responsible in preparing Resettlement Action Plans prior to such land acquisition. Temporary social impacts during drilling activities, such as disturbances to the local population, may also occur during the project. The need to avoid or mitigate such impacts was also discussed with FI of the Project.

As specific subprojects are not identified at this point, all of the potential social impacts and the procedures to manage these social impacts have been covered in a Resettlement Policy Framework (RPF) prepared by TKYB. The RPF prepared by TKYB is disclosed on TKYB's and RSM's official website and in WB's external website.

Other WB Safeguards. No other safeguard policies are expected to be triggered but FI will alert the WB if questions arise.

7. Environmental and Social Monitoring

The environmental and social issues included within the mitigation measures are monitored and supervised by the appointed specialists through the FI of the project. Although the environmental and social impacts are expected to be limited, the potential negative environmental impacts are planned to be prevented or mitigated during the construction and operation stages.

Environmental and social monitoring process starts from the construction phase of the project thorough the operation phase to prevent negative impacts of the project and observe the effectiveness of mitigation measures. This system enables the WB and the

Applicant to evaluate the success of mitigation as part of project supervision and allows to take an action when needed. The monitoring system provides,

- Technical assistance and supervision when needed,
- Early detection of conditions related to mitigation measures,
- Follow up on mitigation results,
- Provide information of the project progress.

The Applicant will prepare quarterly ESMP Monitoring Reports (both for Category A and B projects) which will include but not limited to the items as relevant listed below:

- General Environment
- Air Emissions (CO₂, NO_x, H₂S, all other relevant emissions)
- Soil
- Surface water and groundwater monitoring
- Waste management
- Effluent management
- Biodiversity
- Noise and dust emissions
- Worker Health and Safety
- Public Safety
- Social Monitoring (including land acquisition impacts-if any-, grievance management, community health and safety, labor management and any impacts on vulnerable groups to monitor)

The ESMP Monitoring report should include the data monitored, comparison of the data measured against ESMP and national laws and regulations, any non-compliances observed with respect to international standards and national requirements, the suggested corrective actions and a due date for these actions. These frequent ESMP Monitoring reports will be sent by the Applicant to the FI, and FI is responsible for sharing them with the WB.

8. Grievance Mechanism

The Grievance Mechanism is a process that enables any stakeholder to make a complaint or a suggestion about the way a project is being planned, constructed, or implemented. The Beneficiary will establish a transparent and comprehensive Grievance Mechanism before the implementation of the project to receive and resolve the affected community's concerns, queries, complaints, and grievances about the environmental and social aspects of the project. Public announcements for the establishment of Grievance Mechanism includes:

- Distribution of leaflets to the public places
- Notice Boards
- Website
- Telecommunication Tools
- Public Meetings

The Grievance Mechanism (sometimes also called Grievance Procedure) will be prepared according to WB policies, procedures, laws and regulations.

Detailed procedures for the Grievance Mechanism are provided in the Resettlement Policy Framework (RPF) document prepared for the project, which will also be disclosed publicly.

BENEFICIARY MANUAL 3.1



Appendix 10. Guidelines for various management plans

Annex 10A. Screening checklist for Environmental and Social Safeguards

Table 24 – Screening checklist for Environmental and Social Safeguards

Key environmental and social aspects	Site sensitivity			Rating	WB Policy triggered	Documents required
	Low	Medium	High			
Impact on land use	No impact on land use (protected areas or land with agricultural or forestry value)	Very limited impact on land use (protected areas or land with agricultural or forestry value)	Significant impact on land use (protected areas or land with agricultural or forestry value)		OP 4.01 Environmental Assessment If High: Category A If Medium: Category B If Low: Category C	If High: Environmental and Social Impact Assessment (ESIA)
Impact on landscape	No impact on landscape (including visual impacts)	Limited and mitigatable impact on landscape	Significant impact on landscape			If Low or medium: Annex 10B <i>Environmental and Social Management Plan (ESMP)</i>
SEP						In all cases: Annex 10C <i>Stakeholder Engagement Plan</i>
Impact on archaeology and cultural heritage	No known or suspected cultural heritage sites	Suspected cultural heritage sites, known heritage sites in broader area of influence	Known heritage sites in the project area		If Medium or High: OP 4.11 Physical Cultural Resources	If Medium or high: Annex 10D <i>Cultural Heritage Management Plan (including Change Find Procedure)</i> If Low: chance find procedure only
Impact on habitat and biodiversity	No natural habitats of any kind present	No critical natural habitats, other natural habitats occur	Critical natural habitats present		If Medium or High: OP 4.04 Natural Habitat and OP 4.36 Forest OP 4.01 Environmental Assessment If High: Category A If Medium: Category B If Low: Category C	If High: Environmental and Social Impact Assessment (ESIA) <i>(including Biodiversity Action Plan)</i> If Low or medium: Annex 10B <i>Environmental and Social Management Plan (ESMP)</i>

BENEFICIARY MANUAL 3.1



Key environmental and social aspects	Site sensitivity			Ra-ting	WB Policy triggered	Documents required
	Low	Medium	High			
Impact on water resources	Water flows exceed any existing demand, low intensity of water use, potential water use conflicts expected to be low, no potential water quality issues	Medium intensity of water use, multiple water users, water quality issues are important	Intensive water use, multiple water users, potential for conflicts is high, water quality issues are important		OP 4.01 Environmental Assessment If High: Category A If Medium: Category B If Low: Category C	If High: Environmental and Social Impact Assessment (ESIA), If Low or medium: Annex 10B <i>Environmental and Social Management Plan (ESMP)</i> In all cases: Annex 10I <i>Effluent Management Plan</i> and Annex 10J <i>Hazardous Material Management Plan</i>
Air emission	No or very limited expected air emission,	Increased CO ₂ and H ₂ S emission due to drilling and well testing	Significant expected increase of geothermal gas emission during drilling and well testing		OP 4.01 Environmental Assessment If High: Category A If Medium: Category B If Low: Category C	If High: Environmental and Social Impact Assessment (ESIA) If Low or medium: Annex 10B <i>Environmental and Social Management Plan (ESMP)</i> In all cases: Annex 10E <i>Occupational Health and Safety Management Plan</i>
Occupational Health and Safety						In all cases: Annex 10E <i>Occupational Health and Safety Plan (including Emergency Response Plan)</i>
Community Health and Safety						In all cases: Annex 10K <i>Community Health and Safety Management Plan</i>
Road Safety						In all cases: Annex 10G <i>Traffic Management Plan</i>

BENEFICIARY MANUAL 3.1



Key environmental and social aspects	Site sensitivity			Ra- ting	WB Policy triggered	Documents required
	Low	Medium	High			
Involuntary resettlement and land acquisition	Low population density, dispersed population, legal tenure is well defined	Medium population density, mixed ownership and land tenure	High population density, major towns and villages, low income families, communal properties		<p>If Medium, High or if resettlement or expropriation is foreseen: OP 4.12 Involuntary Resettlement</p> <p>If lands are already rented or acquired: OP 4.12 Involuntary Resettlement</p> <p>If lands will be acquired without public interest decision and on a Willing Buyer/Seller basis: OP 4.12 not triggered</p>	<p>If Medium, High or if resettlement or expropriation is foreseen: Annex 10F/12I, 12G - <i>Resettlement Action Plan (RAP) or Abbreviated RAP</i></p> <p>Lands Previously Rented/Acquired: <i>mention in relevant sections of ESIA/ESMP and prepare Ex Post Social Review- Annex 12H</i></p> <p>Cases where there are no public interest decisions; <i>no need to prepare ARAP/RAP for land take that will take place under WBWS conditions or rental agreements made to use land. Such issues will be reported in regular monitoring reports with proof of justification (i.e rental agreement, consent letter, comparison against market prices etc.)</i></p> <p>In all cases: Annex 10C <i>Stakeholder Engagement Plan</i></p>
Impact on livelihoods	No impact on livelihoods*	Some impact on livelihoods*	Significant impact on livelihoods*		If Medium or High impact on livelihoods is foreseen: OP 4.12	If Medium, High or if any loss of livelihood (including economic resettlement): Annex 10F and Appendix 11.

BENEFICIARY MANUAL 3.1



Key environmental and social aspects	Site sensitivity			Ra-ting	WB Policy triggered	Documents required
	Low	Medium	High			
					Involuntary Resettlement	
Waste						In all cases: Annex 10H Waste management <i>Plan</i>

*Impact on livelihoods includes economic resettlement, i.e. loss of livelihoods includes land-take where land is the sole or major income.

Conclusion of screening:

Summary of applicable Operational Policies. Applicable policies shall be marked by X based on the screening table above	Applicable WB OP's
	OP 4.01 Environmental Assessment
	OP 4.04 Natural Habitat
	OP 4.11 Physical Cultural Resources
	OP 4.12 Involuntary Resettlement
	OP 4.36 Forest
Summary of applicable Safeguard Documents. Applicable documents shall be marked by X based on the screening table above	Applicable Safeguards Documents
	Environmental and Social Impact Assessment (ESIA), Category A in accordance with WB OP 4.01
	Environmental and Social Management Plan (ESMP), Category B in accordance with WB OP 4.01 and Annex 10B
	Stakeholder Engagement Plan (Annex 10C)
	Cultural Heritage Management Plan (including Change Find Procedure) (Annex 10D)
	Occupational Health and Safety Management Plan (including Emergency Response Plan) (Annex 10E)
	Resettlement Action Plan (Annex 10F and Annex 12I)
	Abbreviated Resettlement Action Plan (Annex 12G)
	Traffic Management Plan (Annex 10G)
	Waste Management Plan (Annex 10H)
	Effluent Management Plan (Annex 10I)
	Hazardous Material Management Plan (Annex 10J)
	Community Health and Safety Management Plan (Annex 10K)
	Ex Post Social Review (Annex 12H)

Annex 10B. Guidelines for preparation of Environmental and Social Management Plan

This Appendix presents the contents of Environmental and Social Management Plan (ESMP) and useful tables. According to OP 4.01 (Environmental Assessment), projects shall be screened for potential environmental and social impacts and classified into one of three main categories, A, B and C. Category A projects are expected to have significant adverse environmental and social impacts that are sensitive, diverse or unprecedented. Projects are classified as Category B projects if its potential adverse environmental and social impacts on human populations or environmentally important areas are less adverse than those of Category A. These impacts are site specific and few if any are irreversible. Category C projects are expected to have minimal or no adverse environmental and social impacts. Normally an Environmental and Social Impact Assessment (ESIA) is required for Category A projects, whereas Environmental and Social Management Plan (ESMP) is required for Category B projects. No Environmental Assessment is required for Category C projects.

Although most RSM exploration drilling projects are expected to be classified as category B, the final decision will be based on environmental and social screening (Annex 10A).

The main objectives of preparation of ESMP are to:

- Describe and examine the project's potential negative and positive environmental and social impacts
- Recommend measures needed to minimize, mitigate, or compensate for adverse impacts
- Improve environmental and social performance
- Ensure proper monitoring and response to failures of environmental and social management measures
- Ensure public consultation
- Define roles and responsibilities

The following aspects should be addressed in each ESMP:

- Project summary
- Description of the relevant baseline conditions
- Summary of impacts
- Description of mitigation measures
- Description of monitoring program
- Institutional arrangements and outline of roles and responsibilities

The summary of impacts shall identify the predicted adverse environmental and social impacts for which mitigation is required. Table 26 below can be used to summarize the potential negative and positive environmental and social impacts.

Each mitigation measure shall be briefly described with reference to the impact to which it relates. The suggested mitigation measures shall be supported by relevant references, designs, equipment descriptions and/or operating procedures. Monitoring is important to evaluate environmental and social performance. Thus, monitoring program shall be designed to ensure mitigation measures are undertaken in case the proposed measures are inadequate or if impacts were underestimated. The monitoring program shall be linked to the impacts identified and methods to be used, such as sampling locations, frequency, and threshold limits. Table 36 (in Annex 12A) shows an example of a table that can be used to summarize monitoring activities. The contents of the table can also be split into more tables as appropriate. Potential environmental and social impacts of

RSM exploration drilling is listed in Appendix 9, ESMF as well as suggested mitigation measures. This can be used as the backbone of the ESMP's as appropriate.

Responsibilities for mitigation and monitoring shall be clearly defined and arrangements for coordination between various responsible actors shall be defined. This includes Beneficiaries, contractors, and administrative entities.

The ESMP shall make reference to the appendices listed in Table 25 as appropriate, but also include Table 26 on potential impacts, Table 35 (see Annex 12A) on mitigation measures and Table 36 (see Annex 12A) on monitoring.

Table 25 – The appendices listed below gives guidance to preparation of safeguard documents that may be required for RSM projects

Applicable Safeguards Documents
Environmental and Social Impact Assessment (ESIA), Category A in accordance with WB OP 4.01
Environmental and Social Management Plan (ESMP), Category B in accordance with WB OP 4.01 and Annex 10B
Stakeholder Engagement Plan (Annex 10C)
Cultural Heritage Management Plan (including Change Find Procedure) (Annex 10D)
Occupational Health and Safety Management Plan (including Emergency Response Plan) (Annex 10E)
Resettlement Action Plan (Annex 10F)
Abbreviated RAP (Annex 12 G)
Ex-post Social Audit (12 H)
Traffic Management Plan (Annex 10G)
Waste Management Plan (Annex 10H)
Effluent Management Plan (Annex 10I)
Hazardous Material Management Plan (Annex 10J)
Community Health and Safety Management Plan (Annex 10K)

Table 26 – Summary of potential impacts for exploration drilling and testing

Environmental and Social Impacts	Project Phase	Duration and Significance of the Impact	Summary Description of Potential Impact
Negative/Positive Impacts			
Biodiversity			
Soil erosion, land degradation and land quality			
Water Resources			
Air quality			
Noise			

BENEFICIARY MANUAL 3.1



Environmental and Social Impacts	Project Phase	Duration and Significance of the Impact	Summary Description of Potential Impact
Land loss/acquisition			
Loss of vegetation			
Waste management			
Landscape and visual impacts			
Traffic and Transport			
Cultural Heritage and Archaeology			
Community Health and Safety			
Occupational health and safety			
Employment Opportunities - Socio - economic benefit.			
Socio economic development			

Annex 10C. Guidelines for preparation of Stakeholder Engagement Plan

A Stakeholder Engagement Plan (SEP) shall be prepared by Beneficiaries when appropriate (see the screening checklist in Annex 10A). At least two public consultation meetings shall be held for Category A projects (Annex I of the Turkish EIA regulation). The first meeting shall be on the ESIA TORs for the proposed supplementary documents. The second meeting shall be held when the supplementary environmental assessment documents are in draft form. At least one public consultation meeting shall be held for Category B projects.

Public consultations shall be widely announced at least two weeks before the consultation, using local newspapers and other local means of information dissemination that are known to be effective. For both Category A and B projects, the Beneficiary shall ensure that draft ESIAs and ESMPs and other assessment or supplementary documents are available in public places and meeting announcement will point out the location. The minutes of public meetings shall be recorded and included in the ESIA/partial and ESIA/ESMPs of subprojects.

During these meetings, local people shall be informed about the methodology of land acquisition (expropriation, willing buyer, willing seller procedures, etc.). Moreover, the overall methodology of the land acquisition methods, the timeframe assumed for this phase and the contact point from Applicant's side should be presented. The projects shall be discussed in focus groups to engage specific groups within each community that may require special attentions (e.g. women, young people, vulnerable people).

The main objectives of a SEP are to:

- Identify stakeholders for the proposed project.
- Analyze the relationship of the stakeholders with the project.
- Build and maintain a constructive relationship with the stakeholders, and in particular project-affected communities.
- Promote improved environmental and social performance through effective engagement with the stakeholders.
- Promote and provide means for adequate engagement with project-affected communities throughout the project cycle on issues that could potentially affect them and to ensure that meaningful environmental and social information is disclosed to them and to other stakeholders.
- Ensure that all stakeholders have ways to access project information and raise issues.
- Ensure that project-affected communities have accessible means to raise issues and grievances, and that the Project Company responds to and manages such issues and grievances appropriately.

The items listed below shall be addressed in each SEP (see SEP template provided in Annex 12B):

- Project area and area of influence.
- Roles and responsibilities.
- Stakeholder identification.
- Stakeholder engagement approach and tools (e.g. meetings, websites, brochures, media advertisements, grievance mechanism).
- Outputs of social field studies and group discussions.
- Required land acquisition.
- Grievance mechanism.

Table 27 can be used in the Social Engagement process and reports.

Table 27 – Stakeholder identification

	STAKEHOLDER GROUPS	STAKEHOLDER IDENTIFIED
1	Government authority (Central and Local)	
2	Local Communities	
3.	Non-governmental organizations	
4.	Media	
5.	Private sector companies	

Table 28 below can be used to describe what topics related to the proposed project, its contiguity with stakeholders as well as how and when topics (and updates) shall be presented.

Table 28 – Stakeholder engagement approach

	Stakeholder	Topics	Frequency	Methods and materials	Responsibility
1					
2					
3					

Table 29 – Summary of Community Level Surveys

Name of neighbourhood or institution	Project information given	Perceived positive impacts and suggestions	Perceived negative impact and suggestions

The key topics listed below shall be discussed in focus group discussions. Stakeholder engagement reports shall address a summary of each topic.

- Project information.
- Questions raised by each group members.
- Suggested information tools (e.g. printouts, brochures, banners).
- Perceived positive impacts.
- Perceived negative impacts.

Grievance Mechanism

A grievance is a concern or complaint raised by an individual or group affected by any RSM project.

The grievance mechanism shall facilitate and follow up on the resolution of affected people's grievances and concerns about the environmental and social performance of each project. The grievance mechanism shall be accessible to the stakeholders at all times during the project cycle, and all responses to grievances are recorded and included in project supervision formats and reports.

Objectives of a grievance mechanism are:

- To provide stakeholders with a clear process for providing comment and raising grievances.

- To allow stakeholders the opportunity to raise comments/concerns anonymously through using the community suggestion boxes to communicate.
- To structure and manage the handling of comments, responses and grievances, and allow monitoring of effectiveness of the mechanism; and
- to ensure that comments, responses, and grievances are handled in a fair and transparent manner, in line with internal policies, international best practice and lender expectations.

Personal confidentiality when requested shall be guaranteed in reports.

All affected people shall be encouraged to channel their grievances through the grievance mechanism. All grievances raised shall be documented and reported to the RSM unit.

A grievance closeout form shall be filled by the Beneficiary responsible in a form as presented in Annex 12C and 12D.

Grievance forms must be shared in the project site and village headmen's office to collect written complaints from the locals.

If the complaint is received via phone or verbally through meetings and visits to Beneficiaries (either in its office or site) grievance form must be filled by the company responsible.

If the complaint is received via mail or email, grievance form can be filled by the company responsible, or the email print-out or mail can be attached to the close-out form.

Annex 10D. Guidelines for preparation of Cultural Heritage Management Plan and Chance Find Procedure

Wherever archaeological and cultural heritage sites may be within a project impact area, impact mitigation shall be controlled by Cultural Heritage Management Plan (CHMP) and Change of Find Procedure according to WB's OP 4.11 (Physical and Cultural Resources) and Turkish law on Preservation of Cultural and Natural Assets (Gazette no 2863).

The main objectives of CHMP are to:

- Define potential archaeological and cultural heritage sites within the project impact area.
- Outline the regulatory framework for protection of cultural heritage.
- Define roles and responsibilities.
- Outline implementation of the CHMP in order to protect cultural heritage values in the impact area.
- Define training, monitoring, auditing, and reporting requirements.
- Define chance find procedure.

The roles and responsibilities listed above shall include responsible entities (public and private) as well as roles and responsibilities within the Beneficiary's team (managers, contractors, and project workers).

The CHMP and chance find procedure prepared by Beneficiaries shall ensure that project workers are informed how to react in case of archaeological findings and on measures to be taken for protection of the cultural heritage in the project impact area. Furthermore, the CHMP and chance find procedure shall ensure that construction is put on hold until authorities have confirmed how to react to the findings.

Annex 10E. Guidelines for preparation of Occupational Health and Safety Management Plan

This Appendix introduces general guidelines for the preparation of Occupational Health and Safety Management Plans (OHSMPs). The main objective of OHSMPs is to ensure safe and healthy working environment by careful planning, routine inspections, safety awareness, training of all personnel and safety meetings. All Beneficiaries shall apply *Zero Accident Policy*.

Although OHSMPs are prepared and delivered, OSHMPs should be frequently reviewed and updated as needed. Incidents, accidents, new methods, and changes in the working environment (new methods, new materials, tools, etc.) are examples of items that must be taken into account when OHSMPs are reviewed and updated. All workers and subcontractors involved in drilling, construction or any other activities supported by the RSM shall read the appropriate OHSMP and shall be encouraged to prevent accidents and incidents detrimental to people and environment. The OSHMP should be linked with the Traffic Management Plan (Annex 10G) and the Hazardous Material Management Plan (Annex 10J).

The items listed below shall be addressed in each OHSMP:

- Policy, Leadership, Commitment
- Emergency Response Plan
 - The Emergency Response Plan shall outline how to response to general and sector-specific emergencies i.e. well blow-out (what phone number to call, whom to contact, how to contact, where to gather, etc.)
- Outline of health and safety issues and goals of the OHSMP.
- Roles and responsibilities (including roles and responsibilities of subcontractors)
- Applicable laws and regulations (6331 Code on OHS Law and relevant regulations)
- Training plan and goals
- Risk analysis and preventive measures
- General health and safety requirements (including instructions, personal protective equipment, work clothes, caution labels, tool inspections and required qualifications)
- Access to well pads during drilling and testing
- Measures against coronavirus pandemic to be integrated into OHS Management Plan, CHS Plan and EPRP.

Examples of forms that can be used in Beneficiaries OHSMP are found below.

Table 30 – Incident report

Date/Time:	Name:
Location:	Signature:
Description of incident:	
People involved or connected:	Other:
Instructions from on site supervisor/management if any:	
Description of responses:	
Description of responses to prevent repetition of the incident:	

Table 31 – Risk analysis and preventive measures

Project component	Risk analysis	Actions to prevent accidents

Please note that above table is a very simple representation of a risk analysis study. Kindly ensure that below components are included in risk analysis study considering the national Regulation on Risk Assessment:

- Title of the workplace, address and name of the employer.
- The names and titles of the realtors and the document information given by the Ministry of those who are occupational safety experts and workplace physicians.
- Date of execution and validity date.
- Name of each if the risk assessment is done separately for different departments in the workplace.
- The hazards of the identified sources and hazards.
- Identified risks.
- The method or methods used in risk analysis.
- Analysis results including the importance and priority of the identified risks.
- Corrective and preventive control measures, implementation dates and the risk level detected after.

Annex 10F. Guidelines for preparation of Resettlement Action Plan

Land acquisition/expropriation in the Turkish legal framework is based on the Expropriation Law No. 2942. Resettlement is regulated by the Resettlement Law No. 5543. The contents of these Laws are discussed in detail and compared to OP 4.12 in Appendix 11, RPF.

WB's OP 4.12 points out that involuntary resettlement may cause severe long-term hardship, impoverishment, and environmental damage unless appropriate measures are planned and carried out. Thus, the OP highlights three main objectives:

- a. Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.
- b. Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.
- c. Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

Each RAP shall include the following:

- Description of the project. General description of the project and identification of the project area.
- Description of potential impacts. This shall include identification of:
 - Project component or activities that give rise to resettlement
 - Area of impact of such component or activities
 - Alternatives considered to avoid or minimize resettlement
 - Mechanisms established to minimize resettlement, to the extent possible, during project implementation.
 - Loss of livelihood due to involuntary resettlement
- Outline of the main objectives of the RAP.
- Results of socioeconomic studies including results of a census survey covering:
 - Current occupants of the affected area
 - Standard characteristics of displaced households, including a description of baseline information on livelihoods and standards of living (including health status) of the displaced population
 - Magnitude of the expected loss—total or partial—of assets, and the extent of displacement, physical or economic
 - Information on vulnerable groups or persons as provided for in OP 4.12
 - Provisions to update information on the displaced people's livelihoods and standards of living at regular intervals so that the latest information is available at the time of their displacement.
- Outline of the Legal framework, including:
 - Laws and regulations related to the resettlement activities
 - Gaps between Turkish law and WB requirements (see Appendix 9)
 - Entitlement matrix (see Appendix 11, Section 10)
- Eligibility. Definition of displaced persons and criteria for determining their eligibility for compensation and any other resettlement assistance. This shall include involuntary land intake that may have negative impact on income and livelihood.
- Outline of vulnerable groups, how they may be affected by involuntary land take and description of measures to prevent loss of livelihoods.
- Valuation of and compensation for losses (including loss of livelihood).

- Resettlement measures. A description of the packages of compensation and other resettlement measures that will assist each category of eligible displaced persons to achieve the objectives of OP 4.12.
- Site selection, site preparation, and relocation. Alternative relocation sites considered and explanation of those selected, covering:
 - Current occupants of the affected area
 - Institutional and technical arrangements for identifying and preparing relocation sites, locational advantages, and factors at least comparable to the advantages of the old sites, with an estimate of the time needed to acquire and transfer land and ancillary resources
 - Measures necessary to prevent land speculation or influx of ineligible persons at the selected sites
 - Procedures for physical relocation under the project, including timetables for site preparation and transfer
- Housing, infrastructure, and social services: Plans to provide housing, infrastructure (e.g., water supply, feeder roads), and social services (e.g., schools, health services)
- Community participation: Involvement of project-affected people (PAP) and host communities, including:
 - Description of the strategy for consultation with and participation of resettled people and hosts in the design and implementation of the resettlement activities
 - Summary of the views expressed and how these views were taken into account in preparing the resettlement plan
 - Review of the resettlement alternatives presented, and the choices made by displaced persons regarding options available to them, including choices related to forms of compensation and resettlement assistance.
- Grievance procedures. Description of step-by step process for registering and addressing grievances.
- Organizational responsibilities outlining:
 - The organizational framework for implementing resettlement, including identification of agencies responsible for delivery of resettlement measures and provision of services
 - Arrangements to ensure appropriate coordination between agencies and jurisdictions involved in implementation.
- Implementation schedule covering all resettlement activities from preparation through implementation, including target dates for the achievement of expected benefits to resettled people. The schedule should indicate how the resettlement activities are linked to the implementation of the overall project.
- Costs and budget shall be presented using:
 - Tables showing itemized cost estimates for all resettlement activities, including allowances for inflation, population growth, and other contingencies
 - Timetables for expenditures.
- Monitoring and evaluation process shall be described as well as monitoring indicators, monitoring methodology and frequency of reporting.

Where magnitude of impacts is limited, Abbreviated Resettlement Action Plan (ARAP) may be sufficient.

- An abbreviated plan covers the following minimum elements:
 - Census survey of displaced persons and valuation of assets
 - Description of compensation and other resettlement assistance
 - Consultations with displaced people about acceptable alternatives
 - Institutional responsibility for implementation and procedures for grievance redress
 - Arrangements for monitoring and implementation
 - Timetable and budget.

Annex 10G. Guidelines for preparation of Traffic Management Plan

Driving remains one with the highest risk in construction and exploration industry whereby accidents has claimed lives and damaged properties.

The purpose of the TMP is to reduce risks associated with motor vehicle travel and to define practical actions which can be put in effect to mitigate road safety risks.

Action to be taken to ensure road safety in each project area shall include:

- Ensuring the driver is properly licensed for the class of vehicle and free from fatigue, drug, or alcohol impairment.
- Driving with care at appropriate speeds for road conditions, ensuring all occupants fasten seatbelts.
- Avoiding the use of all mobile communication devices and other driver distractions, while using any company-leased vehicle on company time, and
- Designating safe areas while working around moving vehicles.

The TMP shall:

- Define road safety hazards (e.g., use of mobile (smart) phones, populated areas, pedestrians, narrow road sections, bridges, road conditions).
- Define control measures (e.g., road signs, road maintenance, vehicle inspection, vehicle maintenance, speed bumps, use of lights).
- Define tasks and responsibilities.
- Required safety equipment.
- Requirements for drivers and required documents.
- Define training, monitoring and reporting requirements.

Annex 10H. Guidelines for preparation of Waste Management Plan

In order to limit environmental impacts and risks linked to projects under the RSM, Beneficiaries shall prepare Waste Management Plan as required in Annex 10A, Screening Checklist for Environmental and Social Safeguards.

The main objective of preparation of Waste Management Plans is to identify waste type, as well as to reduce as much as possible waste generation and waste sent to landfills. This goal can be achieved by reuse, sorting, recycling and choice of products, technologies and approaches that incur the least amount of waste in accordance with waste mitigation hierarchy.

The items below shall be addressed in each Waste Management Plan:

- Brief description of waste type
- Roles and responsibilities
- Waste management policy
- Measures to limit waste generation
- Instructions and training of personnel.
- Monitoring and reporting requirements.

Annex 10I. Guidelines for preparation of Effluent Management Plan

In general, effluent is defined as a liquid waste that is discharged to rivers, lakes, the ocean or into sewage systems. The main source of liquid waste from geothermal drilling and testing is recirculated drilling fluid during drilling and geothermal liquid during well testing. To limit potential adverse environmental impacts of the RSM, storage of drilling fluids in ponds and re-injection of geothermal liquid during well testing is required. Management of other liquid waste generated on drilling sites (such as sewage) shall also be taken into account in the Effluent Management Plan.

The main objectives of preparation of Effluent Management Plan is to:

- Ensure appropriate management of drilling fluids and geothermal liquid
- Ensure adequate inspections and response to leakages
- Ensure adequate design of storage ponds
- Define roles and responsibilities.

In order to meet these goals, the Effluent Management Plan shall address the following:

- Roles and responsibilities
- Estimated size of storage ponds and volume of recirculated drilling fluids
- Suggested design of storage ponds
- Type of drilling fluids to be used
- Estimated flow rates (discharge/re-injection) during well testing
- Inspection plan and response plan.
- Training, monitoring and reporting requirements.

Annex 10J. Guidelines for Preparation of Hazardous Material Management Plan

In order to limit environmental impacts and risks linked to projects under the RSM, Beneficiaries shall prepare Hazardous Material Management Plan. Hazardous materials can be defined as substances capable of harming people and the environment, either alone or through incorrect handling. In this respect, it shall be ensured that a hazardous material inventory for particularly both chemical additives of which have hazardous characteristics used during drilling stage and other materials i.e., oils, lubricants, fuels, paints, solvents in place.

The main objectives of a Hazardous Material Management Plan are to:

- Limit the risk of hazardous materials to people and the environment
- Ensure that hazardous materials are properly transported, stored and handled
- Define roles and responsibilities
- Define inspection and response to spills and leakages
- Ensure that appropriate spill kits and first aid kits are available.

The items listed below shall be addressed in each Hazardous Material Management Plan:

- Emergency response to chemical spills
- Storage, handling and labelling of hazardous materials
- Requirements for availability of Material Safety Data Sheets (MSDS)
- Roles and responsibilities
- Access to hazardous materials
- Requirements for availability of spill response kits
- Spill contingency plan.
- Training, monitoring and reporting requirements.

Annex 10K. Guidelines for Preparation of Community Health and Safety Management Plan

Major community health and safety issues in geothermal projects include i) exposure to geothermal gases; ii) facility safety; iii) impacts on water resources; and iv) traffic safety. This Appendix introduces general guidelines for the preparation of Community Health and Safety Management Plan. The main objective of the plan is to ensure safety and health of community by careful planning, routine inspections, awareness, training of community during project development, exploration/drilling and closure phases. Geothermal field infrastructure decommissioning and closure may require detailed planning depending on site-specific issues. The plan should be linked with the Traffic Management Plan (Annex 10G) and the Hazardous Material Management Plan (Annex 10J).

The items listed below shall be addressed in each plan:

- Policy, Leadership, Commitment.
- Outline of health and safety issues and goals of the plan.
- Roles and responsibilities (including roles and responsibilities of subcontractors).
- Applicable laws and regulations.
- Training plan and goals.
- Risk analysis and preventive measures against below topics:
 - Pandemic (coronavirus and other communicable diseases)
 - Release of pollutants and harmful air emissions into ambient air
 - Surface or drinking water contamination
 - Strain on local water supply
 - Release of unpleasant odors
 - Excessive noise
 - Excessive or unregulated vehicle traffic near the facility and through communities at inappropriate times (e.g. children going to school) due to the movement of trucks and other vehicles and machinery to and from the plant
 - Exposure to hazardous substances
 - Exposure to project-related emergency situations (blow-out, fire, explosion, etc.)
 - Improperly controlled or trained security guards
 - Unresolved problems due to absence of external grievance mechanism
- Placement of access deterrents, such as fences and warning signs, to prevent access and warn of existing hazards.
- Managing closure of well heads including sealing well with cement, removing the well head, and backfilling depression around the well head, as necessary.

Appendix 11. Resettlement Policy Framework

1. Project Description and Background

This RPF has been prepared for the Applicant, as it is required by the OP, because specific details and locations of the investments are not known at the time of project appraisal. Had the investments been known in advance, a Resettlement Action Plan (RAP) would have been required for each investment prior to project appraisal. A RAP or Abbreviated Resettlement Action Plan (ARAP), depending on the magnitude of impacts, is required for any land acquisition and/or resettlement carried out by the Beneficiary after the RPF has been approved. This is regardless of when the corresponding BA is signed. This RPF describes anticipated project impacts, the legal framework for land acquisition and resettlement, types of project-affected persons, entitlements and compensation, and the steps that the Applicant will take to ensure compliance with the Operational Policy. Furthermore, this framework also applies retroactively to land acquisition that might have occurred before the Applicant applied to RSM Unit for WB support, if the land was acquired in anticipation of the project within a reasonably recent time period. In such circumstances, an ex-post social review will be used to assess conformity with framework principles and requirements and to preclude social risk, and mitigation measures will be agreed upon between the WB and RSM Unit prior to eligibility under RSM. The RPF becomes part of the BA and describes agreed procedures and reporting requirements that need to be met during implementation of the BA's drilling program.

2. Principles and Objectives

The WB OP 4.12 on Involuntary Resettlement includes safeguards to address and mitigate risks resulting from involuntary resettlement under development projects and covers any involuntary land taking.

The overall objectives of the WB's policy on involuntary resettlement are the following:

1. Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.
2. Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.
3. Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

As part of its due diligence, TKYB is responsible to ensure that any land expropriation or involuntary resettlement associated with a subproject complies with the OP 4.12, Involuntary Resettlement. The purpose of the policy is to avoid or mitigate adverse effects on third parties by development investments. The compliance requirement applies to every project to be financed by an FI with project funds for which either competent authority indicated by the Law issued or will issue a Public Benefit Decision for renewable energy facilities, which enables the Beneficiary to carry out eminent domain for land acquisition for the subproject, and/or for which an investor requests an Expropriation Decision. These decisions enable the investor to carry out eminent domain

for land acquisition for the subproject. The Beneficiaries in most cases will initially try to agree with private owners on a sale of land in the private market, if they cannot agree on the sale, they apply for expropriation procedures to start. For this reason, the initial sale is not considered voluntary under WB Guidelines and OP 4.12 applies to these transactions as well. The WB policy requirements also apply when third parties (such as renters, squatters, or other users of land) are affected, when Government land is transferred to the Beneficiary or when third parties are affected by negotiated acquisition of private land.

Prior to implementation of the resettlement/land acquisition activities, the Beneficiary will apply the following approaches and methodology of social assessment as required by OP 4.12 requirements:

- Minimize resettlement and the acquisition of private land,
- Assess the potential economic and social impacts of land acquisition and resettlement on affected people (on livelihoods of them),
- Identify categories of affected persons and their respective entitlements,
- Promote the process of consultation/participation of project affected people (PAP) in the land acquisition (and resettlement if any) preparation and planning, as well as information dissemination to the PAP. Environmental and Social meetings can be held together where possible,
- Compensate for lost assets at full replacement cost,
- Compensate informal/illegal land users for lost assets and provide assistance in relocating, if needed,
- Compensate and obtain legal access to expropriated land before starting construction,
- Provide information and prepare special assistance programs for vulnerable groups including the persons without any immovable property,
- Provide and prepare the plans for grievance redress and monitoring in line with the WB policy guidelines.

3. Process for Preparing and Approving Resettlement Plans

RSM Unit will be responsible for ensuring that the Beneficiary prepares a RAP (that may also include a social audit of past land acquisition in anticipation of the project) in accordance with this RPF and OP 4.12. RSM Unit, together with the support of the RSM consultant, may need to build capacity and support the Beneficiary in preparation of the RAP. The draft RAP will be disclosed locally and consulted on with the participation of the locally affected persons and landowners. The RAP will be revised and finalized accordingly.

Required Information for the Acquisition of Private Land

With regard to a subproject, the Beneficiary will provide documentation regarding land acquisition needs (including the lands that will be needed for the project in future) and recently completed land acquisition (as presented for a Public Benefit Document or Expropriation Decision) and current status as part of its application under RSM. RSM Unit will review the documentation and determine remedies if there are any circumstances which would jeopardize compliance with OP 4.12. If so, RSM Unit will request additional information from the Applicant and request the WB to review the application to determine an appropriate course of action.

RSM Unit shall provide the documentation of the Public Benefit Document which justifies the land acquisition as well as detailed information regarding landholdings and the anticipated costs of land acquisition. In addition to the standard documentation

indicated above, RSM Unit will request the Beneficiary to use the enclosed Resettlement Action Plan reporting formats (i.e., ARAP in Annex 12G or the full RAP in Annex 12I) to cover the following issues:

- Assessment of the temporary and permanent impact of land acquisition/expropriation and the categories of persons/households affected amount of land/number of plots affected; percentage of land/plot affected in any landholding, land use before and after acquisition, prior land use and number of owners.
- Document the socioeconomic situation of affected households such as how much land is affected, what are their main livelihoods, whether the land impacted is a significant source of their livelihoods. The aim of this documentation is to find out the adverse impacts on livelihoods of displaced persons and providing restoration measures for them to compensate income losses.
- Compensation standards applied for temporary and permanent loss of land, loss of crops, loss of productive trees, loss of residences and businesses (documenting the equivalent of full replacement cost),
- The results of court decisions, if any.
- Provisions for replaced of land, if relevant
- Provide documents for vulnerable groups, grievance redress and monitoring.

Required Information for the Acquisition of Public Land

In addition to acquiring private land, subproject Beneficiaries may benefit from the transfer of lands with title/rights to this land and/or any intangibles related to the land, from the government to the subproject Beneficiaries under applicable law relating to the transfer of public land for projects.

OP 4.12 applies in all cases in which Government land that is transferred to a Beneficiary is being leased to a third party or used informally by a third party prior to the transfer.

If a subproject will use Government land transferred to the Beneficiary, the Beneficiary will provide a Social Impact Screening Form to RSM Unit for submission to the WB (see Annex 12H). The form will be used to document the summary of the transactions, and screen for projects which may be identified to require more information on land acquisition. The documentation must include the following:

- Amount of land previously in use/not in use.
- Number, name, and the socioeconomic situation of affected households (tenants, informal users), such as: how much land is affected, what are their main livelihoods, whether the land impacted is a significant source of their livelihoods.

For each subproject that requires land acquisition, after ensuring that above detailed RAP preparation process is completed, RSM Unit will submit this RAP to the WB for approval before implementation of land acquisition. RAPs will include detailed provision for the planning and implementation of resettlement, meeting the goals of OP 4.12. The scope and level of detail of the RAP varies with the magnitude and complexity of the land acquisition and compensation issues. The plan will indicate the number and ownership of parcels to be acquired or subject to servitude agreements, the amount of each parcel affected, estimated cost of the land and other assets to be acquired or subject to the long term easement, responsibility for execution and schedule for acquisition. The WB will review and confirm documentation on the land acquisition

process to ensure conformance with OP 4.12. Once the RAP is cleared by the WB, the final RAP will be disclosed locally at the project site and the WB's external website.

TKYB has the responsibility to ensure that the project implementation is fully consistent with the RAP, and also to provide for adequate monitoring and reporting of the activities set out in the RAP. As part of RAP implementation, TKYB will provide a summary report of land acquisition activities, starting from the day land acquisition activities are initiated, to the WB every six months, to be included in the overall project progress report, indicating the number and ownership of parcels affected and their current status, the progress of negotiations and appeals, and the price offered and finally paid (reported as number of square meters of the original whole plot and the size of the specific area acquired, and amount per square meter). At the end of the project and as part of project completion report, TKYB will provide the WB with RAP completion report.

If necessary, the WB may contact interested/affected parties to confirm the validity and determine whether the process and outcomes comply with OP 4.12. The WB will regularly supervise RAP implementation to determine compliance with OP 4.12.

4. Anticipated Impacts and Affected Persons

Land acquisition occurs gradually, starting with only a few well areas (about 0.5 hectares each) for the exploration drilling and ending with the full footprint for a plant in operation. The footprint of a geothermal power plant requires land acquisition for the power plant itself, multiple wells, the network of interconnecting pipe work, a transformer station, electricity transmission lines to connect to the grid, access roads and administrative offices. When developers are having well areas expropriated, remaining land of the owner may be left with "holes" and not viable for livelihoods or farming. Similarly, the lattice of interconnecting pipes (about 2 meters wide, installed above ground) can have a more significant impact compared to just the base area for land acquisition due to dividing farmers' plots and cutting off access for people, animals and machinery. Potential impacts of piecemeal expropriation on the livelihoods of farmers should be assessed in the land acquisition plan. In these cases, expropriation of all of the owner's land or other mitigation measures may be necessary.

Geothermal power plants are usually constructed in rural farming areas. Affected persons will include landowners, absentee landowners, renters, sharecroppers, squatters, and other users of land. Since siting allows for some flexibility, acquisition of houses and relocation is not foreseen, but if this takes place, affected persons can include structure owners, asset owners, homeowners, and renters. If the affected persons are conducting business on acquired lands (such as roadside food stall to sell crops), these will also be considered as affected businesses, and anyone who works in the area of business that is not covered by the above affected categories will be taken into consideration.

5. Cut-off Date and Eligibility Criteria for Affected Persons

Any person who will suffer loss or damage to land, an asset, business, trade, or loss of access to productive resources, because of the project will be considered eligible for compensation and/ or resettlement assistance.

The cut-off date for being eligible for compensation and/ or resettlement assistance is the last day during which the census/inventory of assets is completed. Sufficient public awareness of the cut-off date will be given to the community through the responsible agencies, community elders and leaders.

Cut-off date is essential as crops can be cultivated or users can increase assets. Individuals or groups who are not present at the time of registration but who have a legitimate claim to membership in the affected community can be accommodated.

In Türkiye, for the large-scale projects where land acquisition takes more than one year, "public benefit decision" is presented for 15 days in the office of the village head. Following the end of this notification date costs of structures constructed after that date and the trees planted are not considered. On the other hand, Türkiye is moving into the digital cadaster system in the country. Also, population registry system depends on the current addresses of persons. So, fraudulent claims and population influx are prevented through this system. Further to that, the provincial governorships hinder those claims upon the application of Beneficiaries. Furthermore, Turkish resettlement framework includes specific cut off dates regarding application and eligibility to entitlement.

PROOF OF ELIGIBILITY

The Beneficiary will consider various forms of evidence as proof of eligibility as stated in the RPF, to cover the following:

- Project affected persons with formal legal rights, documented in the form of land title registration certificates, leasehold indentures, tenancy agreements, rent receipts, building and planning permits, business operating licenses, and utility bills among others: unprocessed/unregistered formal legal documents will be established in the RAP.
- Project affected persons with no formal or recognized legal rights-criteria for establishing non-formal, undocumented, or unrecognized claims to eligibility shall be established through paying particular attention to each situation and its peculiarities.
- Alternative means of proof of eligibility will include: Affidavit signed by landowners and tenants; witnessing or evidence by recognized administrative authority.

Generally, only project affected persons enumerated during the census/inventory of assets shall be eligible for either the compensation or supplemental assistance. Any new structures or additions to existing structures carried out after the cut-off date will not be considered affected, and their owners or occupants will not be eligible for compensation or supplemental assistance (unless they can demonstrate the census/inventory of assets failed to identify them as affected).

ENTITLEMENT POLICY

The following PAP would be entitled to compensation and rehabilitation measures/resettlement:

1. PAP Losing Land or Structures (or losing access to those assets) and/or having to physically relocate due to loss of livelihood or losing access to income sources or means of livelihood: Generally, all PAP with legal rights of land use. There will be compensation for land, structures, and economic assets on land at full replacement value. Resettlement assistance in line with the WB policy requirements will be provided for them.
2. PAP with loss of crops or economic trees: It is assumed that PAP would be able to harvest any crops planted prior to the confiscation date. If land must be taken before crops are harvested, compensation will be paid for the estimated crop value. Full compensation will be paid for the replacement value of the economic

- tree, based on cumulative value (calculated on specifically determined balance sheet by taking into bare land value) of the fruit crop for its productive life.
3. PAP losing rental land: Renters will be assisted to find alternative land to rent. Transitional assistance may be necessary to ensure that renter livelihoods are not affected.
 4. PAP who are illegal Users. Those who have no recognizable legal rights or claim to the land they are occupying. There will be no land compensation, but the structures and other assets (trees) on land will be compensated based on replacement value. Those using land unofficially for agricultural or grazing purposes will be assisted to find alternative areas available for use.
 5. PAP without any immovable property, losing their livelihoods due to land acquisition: Those are also entitled to Government Assisted Resettlement upon their request, if they are determined as eligible by the local resettlement commission.

6. Turkish Legal Framework for Land Acquisition, Resettlement and Gap Analysis

OVERALL TURKISH LEGAL FRAMEWORK

In the scope of Turkish legal framework, land acquisition/expropriation is based on the Expropriation Law No: 2942 (amended by Law No: 4650 in 2001). In addition, Article 46 of the Turkish Constitution explains that state and legal public entities, in cases of public benefit, are entitled to entirely or partially expropriate immovable properties in private possession, on condition that the real value of those immovable properties are paid in advance and in cash; and to establish easement rights on these immovable properties in compliance with the procedures and principles set by expropriation law. In other words, Turkish Constitution implies that any immovable property cannot be confiscated unless its expropriation compensation is paid to the owner/s in advance and in cash.

According to Article 8 of Expropriation Law (no: 2942), in all cases where the owners of immovable properties are identified, the first-choice practice is to purchase the land through negotiation. For those owners with whom agreement cannot be reached by negotiation or for owners with unidentified addresses, absentee owners, or for immovable properties over which there are ownership disputes; a lawsuit is filed with the relevant court of first instance for valuation and registration, pursuant to Article 10 of the Expropriation Law, and the expropriation compensation set by the court in the course of the lawsuit is deposited into a bank account to be paid to the owner of the expropriated property. The expropriation compensation for immovable properties with unidentified owner is deposited into a time account with 3-month maturity terms. (A minimum two months is required for notification and negotiations before invoking Article 10 of the Expropriation Law. The actual time increases in proportion with the number of owners and land parcels.)

Expropriation compensations are set pursuant to the criteria set out in Article 11 of the Expropriation Law. Turkish legislation does not require the payment of compensation to tenants, sharecroppers and illegal users of properties who have made no improvements (buildings and/or trees). However, persons who have spent money and constructed/erected buildings or other structures on the lands of other persons are compensated at replacement cost for trees and material costs for buildings.

Right to sue: The owner of the asset can apply to the administrative court for the cancellation of expropriation or to the judicial justice for corrections against mistakes of fact within 30 days after the notification date (Expropriation Law, Article 14).

On the other hand, if the owner is not satisfied with the amount of expropriation compensation determined by the court according to Article 10 of the law, can appeal at Supreme Court.

Apart from the Expropriation law, the damages that occur on the route or on the way to the route (out of the land acquisition area) will be paid by legal responsible agency to the affected persons following the necessary due diligence. These compensations may also cover the reinstatement of the property regarding the contract between landowner and Beneficiary for usage of the land or for servitude. On the other hand, according to the Instructions of the Law Regarding Geothermal Resources and Mineral Waters, the license owner must leave this area (easement or expropriated area) through reinstating the natural situation in conformity with environment.

Announcement: The government notifies the owners of the immovable property to be expropriated through an official registered letter indicating its desire to purchase the subject land through negotiation and paying the price of the land or easement right for such land in cash. For immovable properties over which there is ownership dispute, and unidentified owners, relevant court publicizes the summary of expropriation documents in a local and national newspaper at least once.

Purchasing Upon Agreement / Payment of Compensation / Alienation: Negotiation commission is internally established by the agency responsible for land acquisition to negotiate with property owners. Each negotiation commission is comprised of at least three persons. Prior to negotiation stage, the aforesaid agency sends an official invitation letter to property owner without informing about the estimated value for the asset that had been previously estimated by the valuation commission. Then, negotiation session starts on determined date (Article 8 of Expropriation Law).

Agreement: If an agreement on expropriation value is reached, at first a written agreement (memorandum of agreement) is signed by both sides, then the property ownership transfer (alienation) and payment of expropriation compensation procedures are completed within 45 days. The property owner does not hold a right of objection after this negotiated settlement process.

Non-agreement: If an agreement is not reached during negotiations, a memorandum of nonagreement is signed by two sides and the agency responsible for land acquisition applies to the Civil Court of First Instance with needed documents. The court assigns a day for a trial within 30 days following this application and calls the parties (agency and property owner) for conciliation on a value on the trial day. If the parties cannot reach an agreement upon a value at this first hearing, the judge assigns a date for land survey by a commission, which consists of independent experts, within 15 days, and a new trial date within 30 days. The evaluation process of the immovable property is undertaken by this independent expert commission with the participation of all parties and the village headman. Following the field visit regarding land survey, the expert commission submits its report to the court within 15 days. The report explicitly states the determined value for the property. Then, the court sends this report to both parties. If the parties cannot reach an agreement on this value at the trial again, the judge can assign a new expert commission to finalize the same procedure within 15 days and determines the expropriation value at the next trial day. The Court takes the final decision about the compensation of immovable property in question and alienation/registration of the land

in the name of government. Then, both sides still have the right to appeal to the "Supreme Court" about the valuation. Finally, the property ownership transfer (alienation) and payment of expropriation compensation are completed within 15 days in line with the decision of the court.

It should be noted that the costs of the court process are born by the responsible agency according to the Expropriation Law. Particularly, in case of the court process cannot be concluded within 4 months, legal interest rate is applied to the determined compensation amount as from this deadline. This should also be noted that the expropriation files of deceased owners, absentee owners, persons claiming customary right are directly conveyed to local civil court of first instance by the agency responsible for land acquisition.

According to Article 10 of Expropriation Law, the court of first instance shall summon the property owner by notifying the date of hearing, by attaching the action lawsuit petition of responsible organization and one copy from each document submitted by responsible organization, either through annotated invitation or to those owners whose addresses not reached at the end of investigation carried out by responsible organization through announcement (newspaper advertisement) as per the Law on Notifications. This means that absentee owners are informed through several ways.

In case the owner cannot be determined, Article 10 of the Law reads that the needed measures shall be taken by the court for the aim of providing interest for the amount of expropriation compensation through depositing the amount into a time deposit account with a term of 3 months. In addition, if a land is partially expropriated and in case of the remaining part is not usable, this part shall also be expropriated upon the request of the owner within 30 days following receiving expropriation decision (article 12 of Expropriation Law).

Urgent Expropriation: Article 27 of the Expropriation Law authorizes the organization responsible for expropriation to confiscate the properties required by the project earlier than the time needed in normal expropriation procedure. This process does not prevent challenges of the property owners against the determined valuation.

Mainly, for the expropriation of needed immovable properties Article 27 of the Law prescribes that in cases of the necessity for national defense as for the implementation of the Law on Obligations for Natural Defense (No: 3634) or in cases of the urgency of land expropriation decided by the Cabinet or in cases of emergency, which are stipulated in special laws, any immovable asset can be confiscated by the organization responsible for expropriation. In this case, the sequence of operations (excluding evaluation of immovable properties) is completed later. Through the court (upon request of the responsible organization), the values of the immovable assets are evaluated by an expert commission according to the provisions of Article 10 and 15 of the Law within seven days. The confiscation can be carried out after the determined compensation is deposited in the bank (in the name of the owner) indicated in the invitation letter and an announcement in line with the Article 10 of the Expropriation Law, by the responsible organization.

According to the decision of 5th Civil/Legal Department of Supreme Court/High Court of Appeal in 2008 (No: E 2008/1494, K 2008/3602) the amount of compensation determined according to the article 27 of Expropriation Law is not the final amount of compensation. If a landowner disagrees with the organization responsible for land acquisition on the compensation amount, he can refuse to alienate his land. In this case,

the Responsible organization must take the matter to court according to article 10 of the Expropriation Law. Under those circumstances the responsible organization must invite all owners regardless they agreed and disagreed with the initial compensation to finalize the expropriation process.

TURKISH LEGAL FRAMEWORK FOR RESETTLEMENT

Resettlement activities are regulated by Resettlement Law No 5543. This Law deals with the families applying to related governmental agencies in the project region and requesting government assisted resettlement. Resettlement assistance of the government is provided for entitled families, while expropriation compensation payments are paid to all individuals possessing immovable properties in the project area. According to Article 3 of the Law, three types of resettlement can be applied as for that the choices and requests of affected families. Article 3 of the Law reads this point as follows:

"ARTICLE 3 – (1)

- a) **Agricultural resettlement:** *Agricultural resettlement is implemented through providing a family with the following; agricultural land at the amount of envisaged in special resettlement project prepared by Ministry of Environment and Urbanization, house, management building, animal, agricultural devices and tools, workbench and credits one or more.*
- b) **Non – agricultural resettlement:** *This type of resettlement is implemented through providing a family with the following: building plot at the amount provisioned in special resettlement project, house, devices, tools, workbench and loans one or more.*
- c) **Physical settlement:** *This type of resettlement is implemented through providing construction credit support to a family within the amount of loan determined by the Ministry of Environment and Urbanization for the aim of re-building (moving) of villages because of unsuitability of a village centers or consolidating of villages because of dispersed settlement or villages which are fragmented as a result of disasters; after selling land (house plot) from village development areas to people in need. "*

Article 12 of the Law refers to the resettlement of persons whose immovable assets are expropriated, and specifies eligibility criteria for government assisted resettlement as follows:

" (1) Due to the construction of a dam, an area adjacent to the dam, an area under protection, airport, highway, railway, plant and other facilities related to national economy and defense will be erected by public institutions and organizations; and due to the implementation of special laws and in order to protect historical and natural valuables:

(a) The families who have to leave their locations/places as a result of partial or full expropriation of their immovable properties,

(b) The families who do not own any immovable property, but who reside in the expropriation area at least for three years before the beginning of the calendar year, in which the resettlement planning studies were commenced, will be resettled to the locations/places indicated by Ministry of Environment and Urbanization according to the provisions of this Law, provided that they request.

(2) However, the families who own immovable properties to be expropriated but left their places before the commencement date of resettlement planning studies shall not be resettled. Within the last three years as of this date, the families who sold their immobile properties without any compulsory situation and did not purchase immovable property with the equal or higher value shall not be resettled even if they

did not leave their places. The compulsory situations mentioned above shall be determined by the regulations.

(3) Among the families residing in the expropriation area, those who are affected from the expropriation implemented by the public institutions and organizations, can be resettled by Ministry of Environment and Urbanization to a location indicated within their village boundaries upon their written application if they do not want to be resettled by the government in any other place, provided that the suggestion of relevant Governorate and the approval of the Ministry of Interior are obtained.

(4) Among the families included in the scope of this article, and requested to be resettled by the Government:

- *The families who do not apply within ninety days following the ending date of the announcement of resettlement,²⁸ and*
- *the families who do not commit to deposit the amount determined by Ministry of Environment and Urbanization from their expropriation compensation they received or will receive, or their full expropriation compensation and additional increase awarded by court in the case that the amount of expropriation compensation is lower than the amount (determined by Ministry of Environment and Urbanization) into the account of the Central Account Unit of Ministry of Environment and Urbanization, shall not be resettled. "*

This article states that the affected family (entitled to expropriation compensation) requesting government assisted resettlement has to commit to deposit a certain amount of this compensation to MEUCC. The Regulations/Instructions for implementation of Resettlement Law defines this amount as 120 times of the gross monthly (30 days) minimum wage of any worker who is older than 16 years. If the affected household requesting government assisted resettlement is not entitled to expropriation compensation, then they are not required to pay a down payment (as deposit) to MEUCC. Upon the completion of resettlement construction process the cost of resettlement shall be paid by the household to MEUCC within 15 years after a 5-year grace period and without interest. Naturally, the amount of down payment shall be taken into account (deducted). The amount of down payment is updated as of this netting date.

Furthermore, according to regulations of the Law, if there are workers or persons with pension from any social security organization in the family, total annual amount of their wage/pension should be less than 18 times of monthly minimum gross wage.

Resettlement Assistance: Article 9 of Resettlement Law explains the resettlement assistance (which is similar to WB Standards) as follows:

- a) "At first, house and its' house - plot (for building),
- b) For craftsmen, artisans and tradesmen: workplace and its' building plot and operation credit to enable them providing for their livelihood,
- c) For farmers, land, necessary agricultural inputs, agricultural structures or plot of structure, and in kind and in cash operation and equipment credits as envisaged in agricultural resettlement project (specific),
- d) In case of the request of the right holder families (entitled to resettlement), resettlement credits can be given to the families collectively or individually, if the house, workplace and agricultural land are found by themselves and their suggestions are approved by MEUCC."

²⁸ When the duration of 30 days for notification has been taken into account, the total application time corresponds to 120 days.

Other assistances can be summarized as follows:

“Transportation (moving) of those entitled families to the resettlement areas (sites) shall be provided free of charge by the government according to the ‘Transportation (moving) Project’ to be prepared (specifically) by MEUCC,”

In sum, landless families, renters of houses and/or workplaces, tenant users of the land, legal/illegal users of treasury or forest areas and artisans including itinerant peddlers without immovable property but living in that area can be entitled to government assisted resettlement for which they might be eligible.

Physical Settlement (Article 3.1.c)

According to the Resettlement Law the settlement of families within the boundaries of the same village is possible through providing a plot and a loan for the construction of a new house. This is generally implemented in the villages fragmented by development projects such as dams. So, residential area of the village is partially affected. Eligibility criteria for this option are different from the criteria of “agricultural” and “non-agricultural” full resettlement options aforementioned (mentioned in the Article 3.1.a and 3.1.b of the Law). Family should have been living there at least for one year. This activity does not include income restoration. For this reason, if income restoration is needed, related governorship requests supports of other provincial agencies such as provincial directorate of Food, Agriculture and Livestock (and other related agencies) for providing priorities to canalize the government-support programs to resettlement site.

Table 32 – Physical Settlement

Category of Family (Livelihood loss)	Entitlements			Remarks
Family losing livelihood due to project expropriations	Agricultural Resettlement	Non Agricultural Resettlement		
Category of Family (Livelihood loss)	Entitlements			Remarks
(house and land, land, house)				
Family without any immovable property but losing livelihood due to expropriations	Agricultural Resettlement	Non Agricultural Resettlement		
Family losing only house (residential)			Physical Settlement	This option will be applied in the villages with partially affected residential area.

TURKISH LEGAL FRAMEWORK FOR GEOTHERMAL PROJECTS

Article 22 of Application Regulations of The Law on Geothermal Resources and Natural Mineral Waters explains the procedures and principles of land acquisition that will be carried out by Beneficiaries.

Sub clause (1) of Article 22 explains that the Beneficiary with exploration license carries on his activities through getting permission of property owner. In case of the permission is not obtained, Beneficiary can request provincial governorship (Special Provincial Administration or Head of Coordination of Investment Monitoring in case that metropolitan municipality in the province) for easement of right establishment. If the Administration finds this request convenient, takes "public interest decision".

Sub Clause (2) states that the Beneficiary with operation license carries on his operational activities through obtaining the permission of private property owner. If the owner cannot provide the land for his operational facilities through agreement with the owner, he can apply to the governorship (above mentioned administrations) for easement right establishment or expropriation in line with the Law No 2942.

According to sub clause (3), compensations regarding easement right and expropriation, and related expenses are paid by Beneficiary (license owner).

The area requested to be expropriated is registered in the name of Administration following the expropriation decision and then allocated to Beneficiary (license owner) for the period of ongoing project activities (Sub clause 4).

In case of the need of expropriated properties is over and this situation is reported to Administration, and determined by the Administration, owner of property and license owner are notified that the property in question will be returned to its previous owner in line with the conditions of Expropriation Law. If owner does not want to purchase the property, it remains under the possession of Administration.

License owner cannot use the area (expropriated or easement is applied) out of the purpose. According to sub clause (7) of Article 22, License owner has to leave this area within the duration that indicated its project, through reinstating it as environmentally sound.

BENEFICIARY MANUAL 3.1



GAP ANALYSIS

GAP	Turkish Legal Framework	WB Policy Requirements	Measures to bridge the GAPS
Lack of Information during urgent expropriation,	Article 27 of Expropriation Law permits urgent expropriation without informing right holders,	WB policy documents necessitate public information/consultation and participation regarding all activities of land acquisition and resettlement	If urgent expropriation is unavoidable, public information and consultation meetings will be added to this process. Awareness of affected persons about their rights against expropriation procedure will be insured.
Replacement Cost Land	Valuation of agricultural lands depends on capitalization of annual net income which is calculated by taking into account the market prices.	Full replacement cost will be applied	As the capitalization takes into account the value of equal productive potential (such as; distance to location centers and access roads, irrigation status and easiness of irrigation, health conditions, shape and size of the land, pieces composition of the land, cadaster, location/ position of the land) during valuation, and complementary parts on the land are separately valued and added on the land value, there is no gap at this point, but the cost of any registration and transfer taxes regarding new land will be added to reach full replacement cost.
Replacement cost House plots	Market value	Full replacement cost	Interaction cost regarding any registration and transfer taxes regarding new plot will be added to reach full replacement cost.
Replacement cost of Buildings/ structure	Construction cost approach is used and depreciation (for wear and tear) of the building/structure is deducted. Valuation methodology is the same both in rural and urban area.	Full replacement cost OP 4.12, Annex A, Involuntary Resettlement Sourcebook. Compensation is evaluated in net terms and should allow the affected person to obtain replacement assets of equivalent value. In areas with functioning secondary markets, this does not imply compensation at the cost of new structures.	Depreciation will not be deducted Since the Expropriation Law entails deduction of depreciation, replacement cost will be sought to secure replacement assets of equivalent value. Within the content of the RAP, a project specific mechanism will include supplemental devices that are mentioned in WB documents. Salvage material will be left the owner without charge

BENEFICIARY MANUAL 3.1



GAP	Turkish Legal Framework	WB Policy Requirements	Measures to bridge the GAPs
		Depreciation is not appropriate if it would result in under-compensation. In these cases, some combination of supplemental devices can be used to reach replacement value. Salvage material should be left the owner.	
Entitlement to Expropriation Compensation	Renters of houses and/or workplaces, tenant users of the land, legal/illegal users of forest areas and merchants without immovable property is not entitled to expropriation compensation.	They should be compensated for immovable assets, in addition assisted in their efforts to restore (if possible, improve) their livelihoods. In this respect, OP 4.12 states that lack of full legal title should not be a barrier to assistance.	Assistance by the RAP will be provided for them. It is essential that all persons adversely affected are identified, and that resettlement plans will provide a context-specific description of relevant issues relating to compensation and, if relevant, livelihoods restoration measures. For these assistances, project specific mechanisms e.g., alternative forms of assistance will also be provided.
Entitlement to Expropriation compensation	Persons building structures or planting trees on the land titled in the name of other persons or ownerless, and/or has not been acquired by its customary owner are entitled to receive expropriation compensation as the minimum material value and valuated value of trees.	Full replacement cost	Difference will be paid by project to reach full replacement cost
Pastureland Compensation	Displaced persons benefiting from public properties area are not being compensated since the compensation is paid by the organization (or Beneficiary) to the Ministry of Food, Agriculture and Livestock	They should be provided assistance within the content of RAP.	Local resettlement plans will provide Project specific mechanisms for those persons. Such as providing alternative pastureland.

BENEFICIARY MANUAL 3.1



GAP	Turkish Legal Framework	WB Policy Requirements	Measures to bridge the GAPS
Resettlement planning	There is no statutory arrangement for preparation of a Resettlement Plan covering all displaced persons and host families.	WB policy requires preparation of RAP.	Preparation of a RAP by the Responsible body. This will be a full or abbreviated RAP depending on the number of people affected and whether physical relocation involved. If land is acquired before financial assistance is sought, ex-post (retroactively) reporting procedures will be carried out. Also, for the projects that entail additional and acquisition in future, proactive study and reporting will be carried out.
Institutional Status, Capacity and Coordination, Training	A number of different private and government institutions legally deal with one segment (e.g. cadaster/ land registry, drillings, operations, power generation, land acquisition and resettlement; activities of various ministries, local governorates and private bodies) of the land acquisition and involuntary resettlement processes, with a lack of co-ordination between all agencies involved.	WB Policy requests a coordinated organizational framework for resettlement implementation between all agencies involved.	Responsible organizations and Beneficiaries will provide such co-ordination under Project Implementation Unit Technical assistance, in the form of training and on-the-job support will be provided.
Public information, consultation, participation	There are inadequate provisions regarding public information, consultation and participation in the Expropriation procedure, while Resettlement procedure includes more activities on public information, consultation and participation.	PAP, their communities, and any host communities are to be provided with timely and relevant information, consulted on resettlement options, and offered opportunities to participate in planning, implementing, and monitoring resettlement.	This will be done by the Responsible organization/ Beneficiary
Moving Allowance	A "moving allowance" is provided for the families who are entitled to government assisted resettlement	Assistances such as moving allowances should be provided for displaced persons during relocation	Assistance to cover actual costs will also be provided to self resettlers through a special RAP fund set up by the Beneficiary.

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GAP	Turkish Legal Framework	WB Policy Requirements	Measures to bridge the GAPs
Monitoring	There are no provisions for monitoring in the Turkish legal framework	Arrangements for monitoring, implementation of RAPs and an evaluation of its impacts should be developed in line with the WB policy requirements	Project specific monitoring and evaluation program will be established and included in RAP. Also, monitoring and grievance redress mechanism will include information on how grievances were addressed.
Grievance Redress Mechanism	The existing system does not match WB requirements	Appropriate and accessible grievance mechanisms are to be established.	Mechanism will be established by responsible organization. Also, the RAP will include a detailed GRM.

7. Methods for Valuation of Assets

Under the Turkish legal framework, a valuation committee consisting of a minimum of three persons internally appointed by the agency responsible for land acquisition determines the estimated value of the immovable property to be expropriated, having regard to the information and documents to be obtained from expert persons, institutions and authorities (such as Provincial Directorate for Food, Agriculture and Livestock), the Ministry of Science, Industry and Technology where necessary, and from local real estate agencies as per Article 8 of the Expropriation Law. Number of commissions can be more than one.

The valuation commission determines the estimated ceiling values of immovable properties in the expropriation area. During the valuation of immovable assets or resources, valuation commission (and the expert commission designated by the court) has to take into account the following valuation criteria, which are mentioned in Article 11 of the Expropriation Law:

- The nature of the immovable property or resource,
- The size of the immovable property or resource,
- All the characteristics and elements, which could affect the value of the immovable property or resource, including the individual value of each element,
- Tax declaration if any,
- Previous values of property determined by official bodies at the date of expropriation,
- For lands, the net income that could be derived from the immovable property or resource (without undertaking any changes, using the immovable property or resource in the same conditions on the expropriation date),
- For house plots, the amount for which equal (similar) house plots have been sold without any special purpose, prior to the date of expropriation,
- For structures, official unit prices (annually issued by MEUCC) at the expropriation date, calculations of the cost of building, and depreciation for wear and tear, and
- Any other objective criteria that could affect the value of the property or resource

Value of compensation for easement right establishment corresponds to the decrease in the value of asset or resource stemming from this expropriation. The easement value (compensation) of the land includes income losses. This compensation is determined by expropriation experts of responsible organization.

In order to ensure that valuation of assets is in compliance with OP 4.12, in addition to the Turkish legal requirements listed above, TKYB will follow the Entitlement Matrix in Section 10, which details the entitlements that will be necessary for each type of loss that can be suffered by project affected persons.

8. Implementation Process

A model reporting format and specific use of the Abbreviated Resettlement Action Plan/ Social Impact Screening Form to be prepared by Beneficiaries has been provided (see Annex 12G and Annex 12H) for cases with less than 200 persons that will be affected. The investor will ensure that this Abbreviated (or full) Resettlement Action Plan/ Social Impact Screening Form is submitted to the WB as soon as the final project design footprints have been determined for review and use as supporting documentation in project supervision.

Upon completion of payment of compensation for land acquisition to affected parties for whom compensation is sufficient to redress the impact of land acquisition, the Beneficiary will prepare a land acquisition monitoring report as part of the supervision cycle, which will include the affected parties, lands taken, effects on livelihoods, the amounts and dates of compensation and completion date of land acquisition. Any unresolved compensation issues or expropriation cases taken to the courts will be noted in this report, which will be submitted to the WB in advance of commencement of civil works.

For subprojects where land acquisition was completed (past land acquisition), in order to fulfil compliance with WB's OP 4.12, an ex-post social review would need to be undertaken (See Ex-Post Social Review Form (in Annex 12H))

In cases where land acquisition will result in a significant negative impact on income streams, would necessitate physical resettlement of project-affected people, or in total would affect 200 or more individuals, these impacts will be mitigated using subproject-specific resettlement action plans (RAPs) which follow the guidance and criteria given in the project's RPF and the WB Documents as well. (See Annex 12I and below note)

"A full RAP is required at appraisal whenever land acquisition in a project affects more than 200 people, takes more than 10 percent of any holding, and involves physical relocation of population (OP 4.12, Para. 25; Figure 2.1). An abbreviated RAP is acceptable if fewer than 200 people are displaced. Even if more than 200 people are affected, if all land acquisition is minor (10 percent or less of all holdings is taken) and no physical relocation is involved, an abbreviated RAP is acceptable. If fewer than 200 people are displaced but some physical relocation is involved, the abbreviated RAP is expanded to include a rehabilitation program (OP 4.12, Annex A, endnote 6)."

TKYB will forward the RAP along with all supporting documentation in appropriate format for subprojects that trigger OP 4.12 to the WB for prior review and "no objection". According to the OP 4.12, all RAPs will be disclosed in country, and submitted to the WB for disclosure in the WB's external website. Further, TKYB will report semi-annually to the WB on the land acquisition status of new and on-going investments. For subprojects where land acquisition may have already been initiated without the prior knowledge of TKYB or have been completed some time ago, TKYB will forward the ex-post social review documents assessing past land acquisition and social impact to the WB for approval. All social audit documents for subprojects that trigger OP 4.12 to the WB for prior review and no objection.

Implementation Process for Due Diligence of Past Land Acquisition

Due to the nature of the project, majority of the Beneficiaries who apply to the RSM might have acquired land before, either through private transactions or expropriation. In such case, an ex-post social review needs to be undertaken for compliance of OP 4.12 and to address if there are any gaps to be found against the OP 4.12 requirements. The ex-post review would, make sure that all of the PAP were compensated at their replacement cost, PAP were aware of their rights and entitlements under the RPF, and had knowledge of and access to the grievance redress mechanism for any possible claims, and no vulnerable or severely impacted people were worse off.

In order to apply this framework retroactively and assess that all individual compensation payments were made at replacement cost or under other specified standards, the following procedure will be applied:

- An ex-post social review report will be prepared and shared with the WB for “no-objection”.
- The social review should include the following information:
 - Project description and key components
 - A census of project affected people listed in a Land Acquisition table with, parcel number, % of that parcel affected or acquired under the subproject, land type (dry land, fig tree, etc.), any assets on land, compensation unit price and compensation amount, etc. The land acquisition table (in excel format) will be an annex to the social review report.
 - Methodology of land valuation in order to indicate how the compensation prices were determined and demonstrate if the compensations are at replacement cost or not. According to WB OP 4.12, “replacement cost” would be calculated taking into account any taxes and fees that would be required for PAP to purchase/register replacement land or assets.
 - Impact categories according to Entitlement Matrix
 - Socio-economic information should be collected on the PAP regarding their main livelihoods, whether the land-based activity is a significant source of income for them and whether there are any adverse impacts on their livelihoods resulted from the related subproject.
 - Information at the household level that would enable to identify any specific individuals who fall into vulnerability categories and/or suffer livelihood impacts that are not fully compensated by receiving cash at the replacement value for land and assets. Vulnerable people could be: (but not limited to)
 - Households headed by women with no local extended family support.
 - Households where the head of household is unemployed.
 - Households living below the poverty line and thus eligible for social assistance payments.
 - Households headed by a pensioner with no local extended family support.
 - Households where the head of the household is chronically sick or disabled, and
 - Households owning/using land that may be removed, permanently or temporarily, from use so that individuals are considered to be PAP (severely impacted).
 - If there were any gender specific measures, good practices taken by the investor.
 - In cases where the investor had conducted any consultations, description (i.e. dates, content, level of participation, concerns raised etc.) of consultations with PAP, village heads (mukhtars) and other stakeholders, if any,
 - Grievance Redress Mechanism, Management of Grievances, and if there were any grievances recorded.

Also, there could be supplementary documentation to support the ex-post social review, including but not limited to: land evaluation report by independent real estate valuation agency will indicate the average market prices for different types of land (i.e. unit prices for irrigated land, dry land, etc.) within the project zone and will serve as a baseline in comparing whether compensation paid was in fact equivalent to replacement value.

In case any non-compliance/discrepancies is found within the ex-post social review, then mitigation measures will be taken, and this will be part of an action plan attached to the ESMP of the subproject.

Consultation and Disclosure of Ex-post Social Review: The land acquisition table prepared by the subproject's investor should be consulted with the PAP individually and under their consent. Each individual PAP should be able to verify her/his impact defined in the table. After the ex-post social review report is shared with the WB for review and approval, the report will be disclosed both at WB's external website and in-country in the affected community's headmen office.

There might be individual cases where negative or severe impacts are not addressed through providing full compensation at replacement cost. In such cases, additional assistance needs to be provided to PAP that fall under the pre-defined categories. Categories eligible for additional assistance and content of the additional assistance are defined in the below table.

Table 33 – Additional PAP categories and the required compensation

Category of PAP	Compensation	Principle
Formal and informal users of land in both public and private lands	Structures at replacement cost, standing crops at market value and economic trees at discounted net income. They will also be given relocation allowance or assistance.	Assist PAP to ensure that livelihoods are restored
People who have lost less than 20% of their land	Replacement cost of the loss of land/assets; market value of crops and discounted net income of tree, plus total transaction cost (on behalf of the seller to the authorities; approximately 2.1%) plus next transaction cost (approximately 2.1%), relocation costs (if applicable).	Assist PAP to ensure that livelihoods are restored
Among those who have lost 20% or more of their land, people who demonstrate they have suffered negative livelihood impact	Replacement cost and an income restoration assistance package equivalent of 6 months of minimum wage (or depending on case, a job opportunity)	Assist PAP to ensure that livelihoods are restored
Vulnerable groups (such as single women headed households, households with disabled members, households under poverty line as determined by household receiving social assistance) who demonstrate they have suffered negative livelihood impact	Depending on case, livelihood restoration package such as Equivalent of 6 months of minimum wage	Assist PAP to ensure that livelihoods are restored

9. Funding

All project related land acquisition costs and supplemental RAP costs will be covered by the Beneficiaries. Costs for technical support by the RSM consultant to Beneficiaries and RAP supervision will be covered under the project budget by TKYB.

10. Entitlement Matrix

The compensation measures for the land acquisition and resettlement related impacts which are addressed in this RPF is presented in below matrix.

Turkish legal framework on government assisted resettlement provides resettlement options to project affected families. Some provisions of Resettlement Law and its regulations exceed international standards, for example, each nuclear family within affected household are considered as a separate family/household and entitled to resettlement separately. So, affected persons (excluding willing sellers) will be able to request this alternative, in case of they do not qualify for the GRM they will be able to revert to assistance provided for in below RPF entitlement matrix.

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Table 34 – Entitlement Matrix: RSM

Type of Impact	Ownership Status	Entitlement	Compensation	Principles
Permanent loss of Vacant/non-Residential Land	Private	Owners of land and economic assets Both formal and informal users of land	<u>Owners:</u> Land, and economic assets (including trees etc.) at full replacement cost, market value for lost crops, discounted net income of economic trees etc. <u>Users:</u> Formal and informal users will be compensated for standing crops at market value and economic trees at discounted net income.	Acquisition of land through negotiations. Negotiated payment cannot be less than full replacement cost. Where negotiations fail, acquisition through national legislation with consideration of OP 4.12 (where there are gaps between requirements). PAP will be provided with income restoration assistance if necessary.
	Public	Relevant state authority Both formal and informal users of land	<u>State Authority:</u> Value agreed by state authority, or permission <u>Users:</u> Formal and informal users will be compensated for standing crops at market value and economic trees at discounted net income.	The relevant state authority shall provide a permit for the utilization of land or full compensation will be made to the authority. PAP will be provided with income restoration assistance if necessary.
Permanent loss of land with houses (and other immovables)	Private	Owners of Land and other immovables Both formal and informal users of immovables	<u>Owners:</u> Land and all above ground assets at full replacement cost, relocation allowance or assistance, market value for lost crops, discounted net income of economic trees etc. <u>Users:</u> Formal and informal users will be compensated for only structures at replacement cost, standing crops at market value and economic trees at discounted net income. They will also be given relocation allowance or assistance.	Acquisition of land through negotiations. Negotiated payment cannot be less than full replacement cost. Where negotiations fail, acquisition through national legislation with consideration of OP 4.12 (where there are gaps between requirements). PAP will be assisted for relocation and relevant costs will be covered in addition to income restoration assistance if necessary.

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Type of Impact	Ownership Status	Entitlement	Compensation	Principles
	Public	Both formal and informal users of land	Formal and informal users will be compensated for only structures at replacement cost, standing crops at market value and economic trees at discounted net income. They will also be given relocation allowance or assistance.	The relevant state authority shall provide a permit for the utilization of land or full compensation will be made to the authority. PAP will be assisted for relocation and relevant costs will be covered in addition to income restoration assistance if necessary.
Permanent loss of land with businesses	Private	Owners of Land and businesses	Land, businesses and all above ground assets at full replacement cost, temporary income loss, relocation allowance or assistance	Acquisition of land through negotiations. Negotiated payment cannot be less than full replacement cost. Where negotiations fail, acquisition through national legislation with consideration of OP 4.12 (where there are gaps between requirements). Temporary income losses of business owners will be compensated whereas assistance for relocation of their businesses will be provided and relevant costs will be covered. If needed, income restoration assistance.
Permanent loss of community land	Private	Village Legal Entity	Land, and economic assets (including trees etc.) at full replacement cost	Acquisition of land through negotiations. Negotiated payment cannot be less than full replacement cost. Where negotiations fail, acquisition through national legislation with consideration of OP 4.12 (where there are gaps between requirements).
Limited use of land due to easement	Private	Owners of land and economic assets	<u>Owners:</u> Land and economic assets at full replacement cost, market value for lost crops, discounted net income of economic trees etc.	Acquisition of land through negotiations. Negotiated payment cannot be less than full replacement cost. Here, permanent loss of assets such as structures will be compensated

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Type of Impact	Ownership Status	Entitlement	Compensation	Principles
		Both formal and informal users of land	<p><u>Users:</u> Formal and informal users will be compensated for standing crops at market value and economic trees at discounted net income.</p> <p>Reinstatement of subject land after use</p>	<p>in full whereas a fair compensation for land that will be returned to owner shall be determined. Where negotiations fail, acquisition through national legislation with consideration of OP 4.12 (where there are gaps between requirements).</p> <p>PAP will be provided with income restoration assistance if necessary.</p> <p>Return of land to owner with certain restrictions.</p>
Temporary loss of land (e.g. rental agreements for temporary use of land)	Private	Owners of land	Cash compensation for specified duration and reinstatement of subject land after use	Negotiations will be made to determine the rental amount for the period land will be used. Landowners will be given back the land once it has been reinstated to its former conditions.
Permanent or temporary loss of income	Private	Owners of land Formal and informal users of land	Livelihood assistance; such as 6 months equivalent of minimum wage, one-time allowances equal to rental fee etc.	Assistance for the restoration of livelihoods of those PAP who demonstrate they have suffered negative livelihood impact, and/or those who have lost 20% or more of their land, or vulnerable PAP such as women headed households, households with disabled members, households under poverty line as determined by household receiving social assistance will be provided with any additional compensation that is deemed necessary.

11. Consultations, Communications, and Management of Grievances

WB's OP 4.12 requires that the Applicant must conduct prior consultations with PAP in WB funded project(s). Therefore, the Beneficiary will conduct and document consultation with communities in the area of influence of the project in advance of civil works. This consultation will describe the project's configuration and key features, including any associated infrastructure, (such as roads or transmission lines, temporary worker camps, etc.), inform stakeholders of the approximate project start date and duration; inform people of salient impacts (such as possible employment of local people and skills needed, land acquisition and compensation, resettlement (if any) and income restoration arrangements, and other project benefits). It will be essential to inform local stakeholders of the name, contact information, and times of availability of the designated project official(s) to contact in the event of questions or problems related to land acquisition or other construction-related impacts.

The public contact official will keep records of salient issues or questions raised in discussions and steps taken to facilitate their resolution. He/she will pro-actively advise affected communities of up-coming project developments of significance to the community.

Grievance Redress Mechanism: In order to ensure community co-operation and help preclude potentially problematic social issues, the investor will ensure that the Beneficiary will establish a contact point and designates a contact person who is easily accessible and can help with the resolution of project-related questions or issues not only limited to those related to land acquisition, in compliance with subproject ESIA/ESMP, but also those related to environmental impacts or issues during construction. The Beneficiary will provide toll-free telephone numbers and will keep a grievance redress logbook at the project site and document grievances and how these were resolved. Grievance redress mechanism will operate in line with WB policy requirements.

As mentioned above, Beneficiary will employ or designate a land acquisition and resettlement liaison officer for receiving and logging incoming grievances and conveying them to relevant authorities for resolution if those cannot be redressed in the first step.

Beneficiary will ensure that all types of grievances will be first responded within 7 days from the date of receipt of complaint. If resolution of grievance may take more than 15 days, liaison officer will inform the situation to the Beneficiary and will try to find a solution from related higher-level authorities within 1 month. Also, a database for all kind of received grievances will be logged and kept by the Beneficiary.

Grievances will be received either through toll free phone, written petition, in person or through e-mail. Besides keeping the logbook, two grievance forms will be used for grievance mechanism. First forms would be comprised of as "grievance application form". When the grievance firstly received, a copy of filled grievance form will be given to complainant. Following corrective action and redressing the grievance "close out" form is filled by grievance officer. (Sample Grievance Form is added in Annex 12C.)

Determination of corrective action

In case of the responsible body (regarding the complaint) is a Beneficiary, firstly they will respond to complainant within one week upon receiving grievance. But if the grievance is related to resettlement activities, in this case the grievance will be responded to within utmost 10 days following the date it was received. Following the

first response to complainant, responsible party (or parties) will evaluate the grievance and determine the most appropriate “corrective actions” in consultation with complainant. Responsible party can request to send a commission for field (on site) investigations regarding the grievance. Following the redressing of the grievance, Beneficiary will record a “close out form” indicating verification and sign off.

Grievance redress mechanism will operate in collaboration with monitoring system. Complaints/grievances of women will be logged separately and reported to project monitoring system.

12. Monitoring and Evaluation

Prior experience suggests that the subprojects are unlikely to have significant negative impacts on PAP that are not mitigated by compensation mechanisms. Nonetheless, there may be instances in which negative social impacts are foreseen. At the time of appraisal of a subproject that involves land acquisition or resettlement, TKYB will submit to the WB a subproject-specific monitoring plan to track impacts and, if warranted, help the Beneficiary to develop a mitigation plan to deal with the impacts.

There will be performance monitoring for each subproject showing project activities (already done, done in this period, or remaining to be done) and other related points. Subprojects that impact more than 200 PAP, will establish, an external monitoring (by third party) showing the activities are in compliance with the WB policy requirements and the RAP as well. In case of the suggestion of the WB, “completion audit” or “panel of experts” will be provided by Beneficiaries.

Appendix 12. Suggested Formats

Annex 12A. Environmental and Social Management Plan

An Environmental and Social Management Plan (ESMP) consists of the set of mitigation, monitoring, and institutional measures to be taken during the implementation and operation of the Project to prevent adverse environmental and social impacts or reduce them to acceptable levels. The ESMP submitted to the WB are prepared in English. The ESMP may be developed as a stand-alone plan (i.e., for Category B) or, depending on the nature and the scale of the risks and impacts of the project, be included as part of the ESIA's.

(a) Responsible Party: The authors who prepared the ESMP along with the date of preparation.

(b) Project Description: Present a brief description of the project and its associated activities (i.e. material sources like quarries, high voltage transmission lines, campsites etc.). Include the nature of the investment, the location, and any characteristics of the area that are of particular interest (e.g. near a protected area, area of cultural or historical interest). Also, include a brief description of the socioeconomic conditions in the area. One or more simple maps showing project location and relevant neighboring features should be included unless there is compelling reason not to.

(c) Area of Influence: Present a brief description of the project area include associated facilities or activities that are required for planning construction and operation of the project. Area of influence (AoI) also covers impact zones of project and associated activities.

(d) Environmental and Social Baseline: Present a brief description of the environmental and social conditions of AoI i.e., air quality, water quality, soil quality, odor levels, noise levels, waste / wastewater generation, landuse, protected areas, archeological / historical sites, flora & fauna, socio-economic status, agricultural resources, tourism, people affected from project (PAP) groups, etc.

(e) Potential Impacts: Identify potential impacts of project and associated activities during planning, construction, and operation phase. One approach to accomplishing the potential impacts is to first identify environmental (e.g. air, water) and social (e.g. affected communities) components that may be affected by project and associated activities (e.g. land clearing, waste disposal, wastewater discharge etc.). After identification of environmental and social component, impact route and impact levels should be assessed in reference to national laws, regulations and standards as well as best practices.

(f) Mitigation Plan: This should include a description of the steps to be taken to mitigate the potential impacts on land, water, air and other media during the planning, design, construction and operation phases taking mitigation hierarchy into consideration and specify cost estimates and institutional responsibilities. Particular attention should be paid to the specification of emission limits (e.g. for wastewater discharge) and design standards (e.g. for solid waste disposal sites) and how these compare to Turkish laws (which at a minimum must be met) and any other relevant guidelines such as those in directives of the European Union or limits suggested by the WB group EHS guidelines or other relevant international norms.

(g) Monitoring Plan: This should include a description of the key parameters to be monitored (including monitoring locations, schedules and responsible entities) to ensure

that the construction and operation of the project is in conformance with Turkish law, WB safeguards requirements and other relevant norms and standards. If such details are covered by permits or construction or monitoring contracts these will be referenced as attachments.

(h) Institutional Arrangements: There should be a narrative discussion briefly presenting how the monitoring data is going to be used for sound environmental and social performance - who collects the data, who analyses it, who prepares reports, who are the reports sent to and how often, what is done by the responsible authorities after they receive the information; and how non-compliance with the ESMP is treated.

(i) Consultations with Affected Groups and Non-Governmental Organizations:

The following should be included:

- Date(s) of consultation(s)
- Location of consultation(s)
- Details on attendees (as appropriate)
- Meeting Program/Schedule: What is to be presented and by whom?
- Summary Meeting Minutes (Comments, Questions and Response by Presenters)
- Agreed actions.

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Table 35 – Mitigation plan for exploration

Phase	Impact	Mitigating Measure	Cost to:		Institutional Responsibility to:		Comments (e.g. secondary or cumulative impacts)
			Install	Operate	Install	Operate	
Exploration phase	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						
Decommissioning phase	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						

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Table 36 – Monitoring plan for exploration

						Cost to:		Responsibility to:	
Phase	What <i>parameter is to be monitored?</i>	Where <i>is it to be monitored?</i>	How <i>is it to be monitored/ type of monitoring equipment?</i>	When <i>is it to be monitored -frequently or continuous?</i>	Why <i>is the parameter to be monitored (optional)?</i>	Install	Operate	Install	Operate
Exploration phase									
Decommissioning phase									

Annex 12B. Stakeholder Engagement Plan

1. Introduction/Project Description

Briefly describe the project, the stage of the project, its purpose, and what decisions are currently under consideration on which public input is sought.

Describe location and, where possible, include a map of the project site(s) and surrounding area, showing communities and proximity to sensitive sites, and including any worker accommodation, lay-down yards, or other temporary activities that also may impact stakeholders. Provide a link to, or attach a nontechnical summary of, the potential social and environmental risks and impacts of the project.

2. Brief Summary of Previous Stakeholder Engagement Activities

If consultation or disclosure activities have been undertaken to date, including information disclosure and informal or formal meetings/or consultation, provide a summary of those activities (no more than half a page), the information disclosed, and where more detailed information on these previous activities can be obtained (for example, a link, or physical location, or make available on request).

3. Stakeholder identification and analysis

Identify key stakeholders who will be informed and consulted about the project, including individuals, groups, or communities that:

- Are affected or likely to be affected by the project (project-affected parties); and
- May have an interest in the project (other interested parties). Depending on the nature and scope of the project and its potential risks and impacts, examples of other potential stakeholders may include government authorities, local organizations, NGOs, and companies, and nearby communities. Stakeholders may also include politicians, labor unions, academics, religious groups, national social and environmental public-sector agencies, and the media.

Affected parties

Identify individuals, groups, local communities, and other stakeholders that may be directly or indirectly affected by the project, positively or negatively. The SEP should focus particularly on those directly and adversely affected by project activities. Mapping the impact zones by placing the affected communities within a geographic area can help define or refine the project's area of influence. The SEP should identify others who think they may be affected, and who will need additional information to understand the limits of project impacts.

Other interested parties

Identify broader stakeholders who may be interested in the project because of its location, its proximity to natural or other resources, or because of the sector or parties involved in the project. These may be local government officials, community leaders, and civil society organizations, particularly those who work in or with the affected communities. While these groups may not be directly affected by the project, they may have a role in the project preparation (for example, government permitting) or be in a community affected by the project and have a broader concern than their individual household.

Moreover, civil society and nongovernmental organizations may have in-depth knowledge about the environmental and social characteristics of the project area and the nearby populations, and can help play a role in identifying risks, potential impacts,

and opportunities for the Borrower to consider and address in the assessment process. Some groups may be interested in the project because of the sector it is in and others may wish to have information simply because public finance is being proposed to support the project. It is not important to identify the underlying reasons why people or groups want information about a project—if the information is in the public domain, it should be open to anyone interested.

Disadvantaged / vulnerable individuals or groups

It is particularly important to understand project impacts and whether they may disproportionately fall on disadvantaged or vulnerable individuals or groups, who often do not have a voice to express their concerns or understand the impacts of a project. The following can help outline an approach to understand the viewpoints of these groups:

- Identify vulnerable or disadvantaged individuals or groups and the limitations they may have in participating and/or in understanding the project information or participating in the consultation process.
- What might prevent these individuals or groups from participating in the planned process? (For example, language differences, lack of transportation to events, accessibility of venues, disability, lack of understanding of a consultation process).
- How do they normally get information about the community, projects, activities?
- Do they have limitations about time of day or location for public consultation?
- What additional support or resources might be needed to enable these people to participate in the consultation process? (Examples are providing translation into a minority language, sign language, large print or Braille information; choosing accessible venues for events; providing transportation for people in remote areas to the nearest meeting; having small, focused meetings where vulnerable stakeholders are more comfortable asking questions or raising concerns.)
- If there are no organizations active in the project area that work with vulnerable groups, such as persons with disability, contact medical providers, who may be more aware of marginalized groups and how best to communicate with them.
- What recent engagement has the project had with vulnerable stakeholders and their representatives?

Summary of project stakeholder needs

Table 37 – Example table representing summary of project stakeholder needs

Community	Stakeholder group	Key characteristics	Language needs	Preferred notification means (e-mail, phone, radio, letter)	Specific needs (accessibility, large print, child care, daytime meetings)
Village A	Parents with young children	Approximately 180 households affected; 300 children	Official language	Written information, radio	Child care for meetings—late afternoon preferred timing
Village A	Refugees	38 extended families, poverty level	Language alternative	Visit with translator and civil society representative	Graphics, education on process

4. Stakeholder Engagement Program

Purpose and timing of stakeholder engagement program

Summarize the main goals of the stakeholder engagement program and the envisaged schedule for the various stakeholder engagement activities: at what stages throughout the project's life they will take place, with what periodicity, and what decision is being undertaken on which people's comments and concerns. If decisions on public meetings, locations, and timing of meetings have not yet been made, provide specific information on how people will be made aware of forthcoming opportunities to review information and provide their views. Include the ESMP as part of such information.

Proposed strategy for information disclosure

Briefly describe what information will be disclosed, in what formats, and the types of methods that will be used to communicate this information to each of the stakeholder groups. Methods used may vary according to target audience. For each media example, identify the specific names (for example, The Daily News and The Independent, Radio News 100.6, television Channel 44). The selection of disclosure—both for notification and providing information—should be based on how most people in the vicinity of the project routinely get information, and may include a more central information source for national interest. A variety of methods of communication should be used to reach the majority of stakeholders. The project should select those that are most appropriate and have a clear rationale for their choices. The plan should include a statement welcoming comments on the proposed engagement plan and suggestions for improvement. For remote stakeholders, it may be necessary to provide for an additional newspaper outlet or separate meeting, or additional documents that should be placed in the public domain. The public domain includes:

- Newspapers, posters, radio, television;
- Information centers and exhibitions or other visual displays;
- Brochures, leaflets, posters, nontechnical summary documents and reports;
- Official correspondence, meetings;
- Website, social media.

The strategy should include means to consult with project-affected stakeholders if there are significant changes to the project resulting in additional risks and impacts. Following such consultation, an updated ESMP will be disclosed.

Table 38 – Example table representing strategy for information disclosure

Project stage	List of information to be disclosed	Methods proposed	Timetable: Locations/ dates	Target stakeholders	Percentage reached	Responsibilities
Construction	Traffic management plan	Notification Radio News 100.6 and copy in village hall Poster on community bulletin board	Radio twice daily in weeks of disclosure	Villagers, including pedestrians and drivers	Radio News 100.6 reaches 60% of village Poster on bulletin board reaches another percentage of the population	Community Liaison Officer

Proposed strategy for consultation

Briefly describe the methods that will be used to consult with each of the stakeholder groups. Methods used may vary according to target audience, for example:

- Interviews with stakeholders and relevant organization
- Surveys, polls, and questionnaires
- Public meetings, workshops, and/or focus groups on specific topic
- Participatory methods
- Other traditional mechanisms for consultation and decision making.

Table 39 – Example table representing proposed strategy for consultation

Project stage	Topic of consultation	Method used	Timetable: Location and dates	Target stakeholders	Responsibilities
Construction	Traffic safety	Discussion with village schools Public meeting	ABC elementary school September 4, 3:00 p.m. Village A town hall September 8, 5:30 p.m.	Parents and children in village Community	Community Liaison Officer (CLO) Transportation Engineer, Manager, CLO

Proposed strategy to incorporate the view of vulnerable groups

Describe how the views of vulnerable or disadvantaged groups will be sought during the consultation process. Which measures will be used to remove obstacles to participation? This may include separate mechanisms for consultation and grievances, developing measures that allow access to project benefits, and so forth.

Timelines

Provide information on timelines for project phases and key decisions. Provide deadlines for comments.

Review of Comments

Explain how comments will be gathered (written and oral comments) and reviewed, and commit to reporting back to stakeholders on the final decision and a summary of how comments were taken into account.

Future Phases of Project

Explain that people will be kept informed as the project develops, including reporting on project environmental and social performance and implementation of the stakeholder engagement plan and grievance mechanism. Projects should report at least annually to stakeholders, but often will report more frequently during particularly active periods, when the public may experience more impacts or when phases are changing (for example, quarterly reports during construction, then annual reports during implementation).

5. Resources and Responsibilities for implementing stakeholder engagement activities

Resources

Indicate what resources will be devoted to managing and implementing the Stakeholder Engagement Plan, in particular:

- What people are in charge of the SEP

- Confirm that an adequate budget has been allocated toward stakeholder engagement
- Provide contact information if people have comments or questions about the project or the consultation process; that is, phone number, address, e-mail address, title of responsible person (individual names may change).

Management functions and responsibilities

Describe how stakeholder engagement activities will be incorporated into the project's management system and indicate what staff will be devoted to managing and implementing the Stakeholder Engagement Plan:

- Who will be responsible for carrying out each of the stakeholder engagement activities and what are the qualifications of those responsible?
- How involved will management be in stakeholder engagement?
- How will the process be documented, tracked, and managed (for example, stakeholder database, commitments register, and so forth)?

6. Grievance Mechanism

Describe the process by which people affected by the project can bring their grievances and concerns to the project management's attention, and how they will be considered and addressed:

- Is there an existing formal or informal grievance mechanism, and does it meet the requirements of ESS10? Can it be adapted or does something new need to be established?
- Is the grievance mechanism culturally appropriate, that is, is it designed to take into account culturally appropriate ways of handling community concerns? For example, in cultures where men and women have separate meetings, can a woman raise a concern to a woman in the project grievance process?
- What process will be used to document complaints and concerns? Who will receive public grievances? How will they be logged and monitored?
- What time commitments will be made to acknowledge and resolve issues? Will there be ongoing communication with the complainant throughout the process?
- How will the existence of the grievance mechanism be communicated to all stakeholder groups? Are separate processes needed for vulnerable stakeholders?
- If a complaint is not considered appropriate to investigate, will an explanation be provided to the complainant on why it could not be pursued?
- Will there be an appeals process if the complainant is not satisfied with the proposed resolution of the complaint? Not all projects will necessarily have an appeals process, but it is advisable to include one for more complex projects. In all cases, complainants need to be reassured that they still have all their legal rights under their national judicial process.
- A summary of implementation of the grievance mechanism should be provided to the public on a regular basis, after removing identifying information on individuals to protect their identities. How often will reports go into the public domain to show that the process is being implemented?

7. Monitoring and Reporting

Involvement of stakeholders in monitoring activities

Some projects include a role for third parties in monitoring the project or impacts associated with the project. Describe any plans to involve project stakeholders (including

affected communities) or third-party monitors in the monitoring of project impacts and mitigation programs. The criteria for selection of third parties should be clear. For further information, see the World Bank's Good Practice Note on Third-Party Monitoring.

Reporting back to stakeholder groups

Describe how, when, and where the results of stakeholder engagement activities will be reported back to both affected stakeholders and broader stakeholder groups. It is advised that these reports rely on the same sources of communication that were used earlier to notify stakeholders. Stakeholders should always be reminded of the availability of the grievance mechanism.

8. Alternative approaches and mechanisms for engaging stakeholders in the context of coronavirus pandemic²⁹

Developing safe and effective coronavirus stakeholder engagement and grievance management is an important part of maintaining a proactive communication process and providing communities with information in a timely manner. Key elements to consider during the development of a robust interim stakeholder engagement process to support communication and sharing of information include the following:

- Define a clear protocol for external communications and designate points of contact
- Closely monitor health advisories and guidelines
- Identify critical E&S risks of the company's operations that could be exacerbated by COVID-19
- Identify critical stakeholder engagement activities
- Design or adapt multiple channels
- Build on and coordinate with established national/regional/local platforms
- Identify existing channels and social structures
- Pay attention to vulnerable, marginalized, and remote groups
- Understand operational challenges
- Review and adjust engagement approaches

Design of an Interim Stakeholder Engagement Process

Companies should design an interim process or adapt an existing program that is commensurate with the current level of risks, project activities, and concerns raised by the stakeholders and communities. To manage expectations, companies are advised to clearly communicate the limitations of the interim approach and the extent of what goals a company can or cannot achieve until it resumes normal operations.

Table 40 – Stakeholder engagement, information disclosure and grievance mechanism

COVID -19 Impacts on Engagement and Related Activities	Safe Stakeholder Engagement	Information Disclosure	Grievance Management
How has COVID-19 impacted community engagement and other critical or time sensitive activities?	Identify COVID-19 specific stakeholder engagement methods that the company can implement	Identify the types of information for disclosure and safe approaches for dissemination.	Consider alternative grievance management channels. Identify protocols for

²⁹ IFC INTERIM ADVICE FOR IFC CLIENTS ON SAFE STAKEHOLDER ENGAGEMENT IN THE CONTEXT OF COVID-19 (https://www.ifc.org/wps/wcm/connect/30258731-0e7d-4cb2-863c-a6fb4c6d0d95/Tip+Sheet_Interim+Advice_StakeholderEngagement_COVID19_May2020.pdf?MOD=AJPERES&CID=n9s.b9a)

Has the company communicated these disruptions to the communities	considering its operational context, and in some cases potential heightened risks of reprisals (e.g. government surveillance, security force presence)		protection against retaliation. Communicate to complainants how open complaints will be handled. Reinforce to stakeholders their ability via the grievance mechanism, without fear of retribution.
Examples: Discontinuation of engagement activities related to community development, resettlement/ compensation programs, restricted access to villages, suspension of local sourcing, etc.	Examples: virtual, remote, and safe engagement approaches such as online communication tools, audio options, offline communication channels	Examples: online platforms, and nonelectrical communication channels.	Examples: secure online and offline channels for grievance receipt and resolution.

Alternative Approaches to Engagement

Companies are advised to tailor a program that utilizes a diversified set of communications tools and formats:

Table 41 – Virtual and nonvirtual communication channels

Online Communication Channels - Information Dissemination	Online Communication Channels Stakeholder Engagement	Non-electronic Communication Channels	Specific Considerations for Vulnerable and Marginalized Groups
Digital platforms, social media, and messaging platforms (Facebook, Twitter, WhatsApp), company websites and online community forums for posting project information related to E&S and critical activities.	Online stakeholder engagement workshops, webinars using live web streaming (such as YouTube, Vimeo)	Traditional/religious leaders, community-based organizations, networks (such as women and youth groups, etc.) to disseminate information and gather feedback.	Tailored engagement (language, cultural and accessibility barriers factors). Accessible formats such as print material in Braille or large fonts or pictorial.
Partner with mobile networks to push alerts (such as when information is posted online, and dates/times for online engagement), surveys or questionnaires related to resettlement activities, etc.	Virtual consultation seeking feedback via email, text messages, feedback forms on dedicated project webpage.	Public announcements (such as community billboards, TV, radio, newspapers, standard mail). Pictorial leaflets, printed materials (written and visual project information).	Multiple communication options, such as closed captioning for video/conference calls, or sign language in meetings, audio provision, and graphics.
Develop a dedicated project webpage to share project information and post announcements. Provide a secure grievance portal for logging, tracking, and communicating directly with complainants	Recorded messages posted to webpage, shared through social media with options to submit questions, feedback. Leverage encrypted message apps (e.g. WhatsApp), to share information and engagement with stakeholders, especially in contexts where fears of government surveillance/retaliation may be high.	Radio programs to share information, host live engagement sessions with call-in options for Q&A and providing feedback.	Communication channels accessible to vulnerable stakeholders to enable participation and raise grievances (such as secure telephone hotlines or a trusted local focal point).

Annex 12C. Sample Grievance Form

Reference No		
Full Name		
Please mark how you wish to be contacted (mail, telephone, e-mail).	Please mark how you wish to be contacted	
Province/Town/Settlement		
Date		
Category of the Grievance		
1. On abandonment (public housing)		
2. On assets/properties impacted by the project		
3. On infrastructure		
4. On decrease or complete loss of sources of income		
5. On environmental issues (ex. pollution)		
6. On employment		
7. On traffic, transportation, and other risks		
9-Other (Please specify):		
Description of the Grievance What did happen? When did it happen? Where did it happen? What is the result of the problem?		
What would you like to see happen to resolve the problem?		

Signature:**Date:**

Annex 12D. Sample Grievance Closeout Form

Grievance closeout number:		
Define immediate action required:		
Define long-term action required (if necessary):		
Compensation Required?	<input type="checkbox"/> YES <input type="checkbox"/> NO	
CONTROL OF THE REMEDIATE ACTION AND THE DECISION		
Stages of the Remediate Action	Deadline and Responsible Institutions	
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

COMPENSATION AND FINAL STAGES

This part will be filled and signed by the complainant after s/he receives the compensation fees and his/her complaint has been remediated.

Notes:

Name-Surname and Signature

Date....../...../.....

Of the Complainant:

Representative of the Responsible Institution/Company

Title-Name-Surname and Signature

Annex 12E. Table of Contents for the Public Consultation Documentation

- Manner in which notification of the consultation was announced: media(s) used, date(s), description or copy of the announcement
- Date(s) consultation(s) was (were) held
- Location(s) consultation(s) was (were) held
- Who was invited
- Name, Organization or Occupation, Telephone/Fax/e-mail number/address (home and/or office)
- Who attended
- Name, Organization or Occupation, Telephone/Fax/e-mail number/address (home and/or office)
- Meeting Program/Schedule
- What is to be presented and by whom
- Summary Meeting Minutes (Comments, Questions and Response by Presenters)
- List of decisions reached, and any actions agreed upon with schedules, deadlines and responsibilities.

Annex 12F. TOC for ESIA

Table of Content of a WB Category A ESIA Document.

An Environmental and Social Impact Assessment (ESIA) report for Category A projects and some Category B projects focuses on the significant environmental issues of a project. The report's scope and level of detail should be commensurate with the project's potential impacts. The report and the executive summary submitted to the WB are prepared in English.

The report should include the following items (not necessarily in the order shown):

- (a) *Executive summary.* Concisely discusses significant findings and recommended actions.
- (b) *Policy, legal, and administrative framework.* Discusses the policy, legal, and administrative framework within which the EA is carried out. Explains the environmental requirements of any co-financiers. Identifies relevant international environmental agreements to which the country is a party.
- (c) *Project description.* Concisely describes the proposed project and its geographic, ecological, social, and temporal context, including any supporting infrastructure that may be required (e.g., dedicated pipelines, access roads, power plants, water supply, housing, and raw material and product storage facilities). Indicates the need for any resettlement plan or indigenous people's development plan. Normally includes a map showing the project site and the project's area of influence.
- (d) *Baseline data.* Assesses the dimensions of the study area and describes relevant physical, biological, and, socioeconomic conditions, including any changes anticipated before the project commences. Also takes into account current and proposed development activities within the project area but not directly connected to the project. Data should be relevant to decisions about project location, design, operation, or mitigatory measures. The section indicates the accuracy, reliability, and sources of the data.
- (e) *Environmental and Social impacts.* Predicts and assesses the project's likely positive and negative impacts, in quantitative terms to the extent possible. Identifies mitigation measures and any residual negative impacts that cannot be mitigated. Explores opportunities for environmental enhancement. Identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions, and specifies topics that do not require further attention.
- (f) *Analysis of alternatives.* Systematically compares feasible alternatives to the proposed project site, technology, design, and operation--including the "without project" situation--in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. For each of the alternatives, quantifies the environmental impacts to the extent possible, and attaches economic values where feasible. States the basis for selecting the particular project design proposed and justifies recommended emission levels and approaches to pollution prevention and abatement.
- (g) *Environmental and Social Management Plan (ESMP).* Covers mitigation measures, monitoring, and institutional arrangements.
- (h) Public Consultation Records (copy of meeting announcements, presentation, list of participants, summary of questions and responses, etc.)

(i) *Appendices*

- i. List of EA report preparers – individuals and organizations.
- ii. References – written materials both published and unpublished, used in study preparation.
- iii. Record of interagency and consultation meetings, including consultations for obtaining the informed views of the affected people and local non-governmental organizations (NGOs). The record specifies any means other than consultations (e.g., surveys) that were used to obtain the views of affected groups and local NGOs.
- iv. Tables presenting the relevant data referred to or summarized in the main text.

BENEFICIARY MANUAL 3.1



Annex 12G. Reporting Format for Abbreviated Resettlement Action Plan (ARAP)

(For application to all new subproject investments)

1. INTRODUCTION

This section should include (at minimum) the following information:

- Name & location of Subproject/Project
- Project Sponsor
- Project rationale and objective (the reason why the Project is realized)
- Brief information on Project and (if any) components, installed generation capacity (No. units X MW_e/unit), total amount and type (private/public) of land necessary for the Project etc.
- Reasons for this specific site to be selected.

2. POTENTIAL IMPACTS AND AFFECTED PERSONS

2.1. PROJECT IMPACTS

- What type of impacts will the Project and/or its component(s) have?
- Are these impacts temporary or permanent?
- What will be the types of acquisition for land; permanent, temporary, easement, rental etc.? Are there any anticipated impacts on livelihood? Or just land?

2.2. PAP

- Who are the PAP?
- How and in which way are they affected?
- Are there any vulnerable groups (women, elderly, youth etc.) among PAP? If so, provide info on vulnerable groups.

2.3. ELIGIBILITY CRITERIA

Information on eligibility

3. LEGAL FRAMEWORK AND GAP ANALYSIS

3.1. NATIONAL LAWS AND PROCEDURES FOR LAND ACQUISITION

Brief information on national law (only relevant laws/regulations that apply to the Project)

3.2. WB POLICIES AND REQUIRED MEASURES UNDER OP 4.12

Summary of WB Policies and OP 4.12

2.3. GAP ANALYSIS

Presentation of over exceeding or inadequate regulations that govern the land acquisition process and remedies to overcome them.

4. IMPLEMENTATION, COMPENSATION AND OTHER ASSISTANCE

Summary of land acquisition process:

- Who is responsible of the process?

- How will the land be acquired? (in line with the legislation and Project info –main investment and components if any- provided above)
- When will the process be commenced, after what actions will it be completed?
- Who will be compensated for what type of immovables? (State in Entitlement matrix)
- Will there be any additional measures to restore livelihoods? (State in Entitlement matrix)

Entitlement Matrix

Project Component	Project Impact	Category of Affected Person	Entitlement	Additional Provisions

5. CONSULTATION AND PARTICIPATION

Description of the consultation process to be followed:

- Purpose of consultations
- Party responsible of conducting consultations
- Channels or tools that will be used to inform PAP and other stakeholders
- Frequency of consultations
- Measures for inclusion of vulnerable groups (if any)

6. GRIEVANCE REDRESS MECHANISM

Description of the grievance redress mechanism (GRM):

- Rationale for a GRM
- Party/person(s) responsible of managing the GRM
- Tools/methods to be used
- Provide sample grievance registry (logging) forms and close out forms

7. MONITORING IMPLEMENTATION & REPORTING

- Describe the monitoring and closure arrangements for the RAP.
- Describe the monitoring system in line with WB documents such as performance monitoring, external monitoring by third party (if needed).
- Describe the frequency of reporting and key elements of the monitoring plan.
- Describe content of reports including Beneficiary feedback indicators.

8. TIMETABLE AND BUDGET

List the main issues of implementation and color the relevant boxes for their actualization.

	2020				2021				2022				2023			
Key Implementation Issues	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

BENEFICIARY MANUAL 3.1



Provide the budget for the RAP, showing financial responsibility and authority with regard to all land acquisition and resettlement activities including contingencies.

Add or remove budget items as applicable, please note that costs are anticipated lumpsum figures and are not binding.

RAP budget

Budget Item	Anticipated Cost
Costs of Permits/Licenses	
Compensation Payments	
Costs for Additional Social Support and Resettlement Assistance	
Cost for Monitoring	
Contingency	
TOTAL BUDGET	

Annex 12H. Ex-Post Social Review Format

Ex Post Land Use / Land Acquisition Audit for Geothermal Power Plant Exploration Phase Operations

1. Description of the project

General description of the project and identification of the project area (Should include at least the following)

- Name & Location of Sub-project and Project Sponsor
- Project components (please state if there are any other components other than wells that will require land during exploration)

2. Project's land-based impacts and PAPs/groups impacted

Brief assessment of the following:

- The project components or activities during exploration that gave rise to displacement, explaining why the selected land was rented or acquired; (if any land acquired via expropriation please specify separately in the table)

Table 42 – Number of parcels and PAPs subject to land acquisition

Component	Permanent		Temporary		Total	
	Purchased		Rental			
	# of parcels	# of PAPs	# of parcels	# of PAPs	# of parcels	# of PAPs
Well X						
Well Y						
Other Components (if any)						
Total						

- Profile of PAP(s) and communities impacted by project's land take requirements (including definition of vulnerable groups, if any)
- The scope and scale of land acquisition and impacts on structures and other fixed assets (if any);
- Any project-imposed restrictions on use of, or access to, land or natural resources;
- Alternatives considered to avoid or minimize displacement and why those were rejected; and
- Key dates of land take and land use (start and end dates of rental agreements, acquisition process (if any))

3. Applied land use / land acquisition approach

Approach adopted and actions taken by sponsor to use/acquire land. Should provide details to at least the following.

- Any decisions obtained such as public interest decision for land acquisition
- Arrangements made for rental lands or any practices of willing buyer/willing seller (WBWS) – please provide info on rental conditions, duration and reinstatement conditions if well is to be unsatisfactory
- If any land take via expropriation, application of national law on (normal acquisition process, urgent expropriation)
- Entitlement Matrix (**Only if there is expropriation**. Land use through rental arrangements or WBWS applications will not require an Entitlement Matrix)

Table 43 – Entitlement Matrix

Project Component	Project Impact	Category of Affected Person	Entitlement	Additional Provisions

- Valuation method applied to determine compensation (include justification that payments were made at replacement cost, use comparative tables to showcase current market prices and compensation paid during WBWS applications)
- Compensation arrangements and payments (information on how and when the payments were made, when the process finalized)
- Any additional measures taken to restore loss of livelihoods (include any CSR activities sponsor has carried out)

4. Public awareness and engagement activities carried out

- Stakeholder engagement strategy of the sponsor (is there a project SEP?)
- Any designated staff for engaging with stakeholders including PAPs
- Consultations with dates and purpose carried out up to date

5. Project's grievance redress strategy

- Grievance management of the sponsor (is there a functioning project GRM?)
- Tools/methods employed by the sponsor for grievances collection
- Grievances received up to date (subject and number of grievances, open or resolved, gender disaggregated)

6. Non compliances and proposed suggestions

- Any non-compliances with governing national laws or Bank's OP 4.12
- Suggestions and corrective actions to be considered

Annex 12I. Reporting Format for Full Resettlement Action Plan

(To be used in all cases where land acquisition impacts significantly affect income, necessitate physical resettlement, or in aggregate affect 200 or more persons, in line with the scope and level of details of RAP indicated in WB documents on involuntary resettlement)

1. INTRODUCTION

- Briefly describe the project.
- List project components including associated facilities (if any).
- Describe project components requiring land acquisition and resettlement; give overall estimates of land acquisition and resettlement.
- Attach project site plan or map from screening form, showing land acquisition impacts.
- Attach land ownership, land use map as Annex

2. MINIMIZING RESETTLEMENT

Indicate any design changes made to minimize physical or economic displacement of people.

3. CENSUS, INVENTORY AND SOCIO-ECONOMIC SURVEYS

- Provide additional socio-economic data, needed to develop appropriate remedies for impacts on income streams for affected persons / families or businesses
- Provide brief explanation of inventory or any fixed assets to be acquired for the Project, provide as Annex a complete list of subject inventories (if available).
- Identify any cases of vulnerable people, or people in need of special assistance.

4. LEGAL FRAMEWORK

4.1. NATIONAL LAWS AND PROCEDURES FOR LAND ACQUISITION

Brief information on national law (only relevant laws/regulations that apply to the Project)

4.2. WB POLICIES AND REQUIRED MEASURES UNDER OP 4.12

Summary of WB Policies and OP 4.12

4.3. GAP ANALYSIS

Presentation of over exceeding or inadequate regulations that govern the land acquisition process and remedies to overcome them.

5. RESETTLEMENT SITES

If land-for-land is given, provide details of location, size, capacity of compensating the lost income derived from taken land and any salient features of replacement land. If not, remove heading.

6. ENTITLEMENTS AND INCOME RESTORATION

- Using socio-economic data on affected party, describe income restoration remedies provided.
- Describe any additional economic rehabilitation measures; such as transition and moving allowances, temporary housing, or other measures.
- Describe any special assistance given to vulnerable people or households.
- Describe method of valuation used for affected structures, land, trees or other assets,
 - (recall that OP 4.12 provides for replacement cost of lost assets).

- Summarize all types of impacts and entitlements provided in a matrix form; (as provided below).

Table 44 – Entitlement Matrix

Project Component	Project Impact	Category of Affected Person	Entitlement	Additional Provisions

7. INSTITUTIONAL ARRANGEMENTS

Describe the institution(s) responsible and project level organizational arrangements to ensure preparation and implementation of the RAP.

8. PARTICIPATION AND CONSULTATION

- Describe the stakeholders and the process of consultation and stakeholder participation in preparation and implementation of the RAP.
- Keep records and summarize consultations with affected parties: key issues, how addressed etc. Also report the feedback indicators.
- Describe arrangements (personnel, site offices, etc) to ensure open communications with local stakeholders.

9. GRIEVANCE REDRESS

- Describe the process of registering and addressing grievances related to land acquisition, resettlement or other project impacts on the local community.
- Ensure that this process is cost-free with a reasonable response in short time.
- Involve an independent mutually respected third party in resolving grievances.
- Prepare sample grievance registry (logging) forms and close out forms.
- Keep records of all grievances or issues raised and how resolved or managed to minimize affected parties resorting to the law courts, also report Beneficiary feedback indicators.

10. MONITORING AND EVALUATION

- Describe the monitoring and closure arrangements for the RAP.
- Describe the monitoring system in line with WB documents such as performance monitoring, external monitoring by third party.
- Describe the frequency of reporting and key elements of the monitoring plan.
- Describe content of reports including Beneficiary feedback indicators.

11. IMPLEMENTATION SCHEDULE AND BUDGET

List the chronological steps in implementation of the RAP; ensure that entitlements are given before civil works.

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Table 45 – Implementation schedule

	2020				2021				2022				2023			
Key Implementation Issues	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

Provide the budget for the RAP, showing financial responsibility and authority with regard to all land acquisition and resettlement activities including contingencies.

Add or remove budget items as applicable, please note that costs are anticipated lumpsum figures and are not binding.

Table 46 – RAP budget

Budget Item	Anticipated Cost
Costs of Permits/Licenses	
Compensation Payments	
Costs for Additional Social Support and Resettlement Assistance	
Cost for Monitoring	
Contingency	
TOTAL BUDGET	