Dariali Energy

Construction of Dariali HEPP

Reinstatement Plan

2016

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1. Introduction

Reinstatement of project areas disturbed by Dariali HPP construction activities (e.g.headwork's,pipelineandcamp) to the original landscape character is a specific objective aimed and encapsulates benefits that include:

- Improved likelihood of maintaining HPP integrity against inclement conditions and natural erosion;
- Natural landscape and its tourism resource value are maintained;
- Soil fertility for both natural and agricultural environments is preserved, and thereby reduces the risk of desertification is reduced;
- Water catchments and the associated water quality are protected;
- Bio-diversity of the global genetic pool is sustained.

This plan summarizes the specific requirements developed for reinstating areas disturbed by the project, and takes in to account the anticipated subsequent development of the Dariali HPP project.

The standards for reinstatement are current best practice, and have been developed from international standards and guidelines.

Issues addressed include topographical reinstatement, erosion control, and bio-restoration; and requirements for the extraction, re-uses and if necessary the disposal of material excavated from the pipeline and facilities trench.

The reinstatement strategy is based on the following principles:

- Areas disturbed by construction activities will be restored to pre-construction conditions (e.g. contours) to the greatest extent possible;

- There will be no adverse impacts on sensitive habitats outside of the pipeline and project facilities as a result of construction activities, in particular when forming cuts on side slopes;

- Soils in disturbed areas will be stabilized, using both temporary and permanent controls, to protect the integrity of the pipeline and minimize potential sediment and erosion impacts;

- Topsoil will be handled and stored to retain soil structure, viability of its natural seed bank, and its fertility;

- Topsoil and subsoil operations will be carried out in a way which minimizes the risk of soil loss down slopes and into watercourses;

- Bio-restoration of disturbed areas will be to conditions similar to the immediately adjacent to pipeline and road corridor, and will be undertaken in order to:

  (a) restore the ecology existing before construction, particularly the variety and distribution pattern of plant species, using indigenous flora;

  (b) establish sufficient vegetative cover to minimize erosion and meet the performance target of Erosion Class 3 or better through restoration of the local plant community

Surplus excavated material will be disposed of in an environmentally acceptable manner. Reinstatement activities will be monitored until environmental requirements and goals will be achieved.

2. Site Clean-up

Prior to demobilization the contractor Peri LLC will clean-up all areas affected by construction operations. In other project areas, the contractor will clean-up immediately on cessation of construction activity. Clean-up includes removal of all plant, equipment and materials not required for replacement of soil and subsequent bio-restoration.

The Contractor has started clean-up activities: removal of all plant, equipment and materials not required for replacement of soil and subsequent bio-restoration.

In pre-developed areas (either for agriculture or industry) the cleaned-up condition will be equivalent to, or better than, the condition prior to construction.

Waste materials will not be left, or buried or disposed of in any way on any project area, except for:

- Excess soil and rock;
- Waste disposed of at approved waste disposal sites that will have been selected the project and that have been approved by the relevant authorities to undertake such operations.

3. Headwork Site Reinstatement

Headwork site reinstatement activities will be fully cleared at the completion of the construction activities. At this stage reinstatement of site includes:

- Removal of excess material;
- Site clearance activities (waste, litter/trash should be sent to the approved disposal site);
- Grading and leveling (will be commenced only after the cleanness of the site has been verified);
- Reshaping of the land surface will be accomplished without disruption to adjacent undisturbed areas;
- Final grading shall ensure that the contours of the site blend into the surroundings to the extent feasible.

Leveling and grading activities should be carried out at the rebar and pipes storage area. Accumulated excavated material to be spread and level so, that the contours blend into the surrounding to the extent feasible. Photo below shows rebar storage area.

Monitoring and plan implementation:

Headwork site reinstatement activities has been started and continued with:

- *Removal of excess material;*
- *Site clearance activities (waste, litter/trash sent to the approved disposal site);*
- *Grading and leveling*
- *Reshaping of the land surface*;

The rebar and pipe storage area was cleared from temporary facilities. Leveling and grading activities have been started.

Another step for Headwork site reinstatement should be the reinstatement of Tergi riverbank.

Excavated materials from Headwork site (dam, pipeline, sedimentation basin) has been accumulated alongside to river and also used for river diverting for dam construction. After completion of the Headwork site, Tergi will be returned to its riverbed and excavated material will be used for grading and leveling.

Reinstatement of Tergi riverbank was carried out: Excavated materials accumulated alongside to river and also used for river diverting for dam construction was removed and used for leveling and grading and also for stabilization bottom of the adjacent slope. The river was returned to its natural riverbed and the riverbanks were protected by riprap.

Temporary roads at the headwork site will be dismantled and area will be reinstated. Only one main road is considered to be installed as a pipeline corridor access.

Dismantling temporary roads have been started.

On more point of excavated materials storage has been observed during the site reinstatement survey, close to the headwork. Materials have been used as a layer for pipe temporary storage. Rocky soil has been spread on topsoil for pipe lying. This material should also be taken and re-used. Photos below shows rocky soil spread on topsoil.

No improvement has been observed yet. According contractor works will be carried out after dismantling temporary facilities next to the accumulated materials.

All temporary facilities will be dismantled and removed from site.

Major part of temporary facilities was dismantled;however, facilities are still to be removed from settling basin area. Contractor is planning activities after completing with headwork dam area.

4. Reinstatement of the Pipeline Corridor

Project construction contractor Peri LLC will reinstate the full width of the Pipeline corridor as the base case.

Existing Pipeline corridor and road has already been used as a road before Dariali HPP Project has been lunched. Photo below shows the road on Pipeline corridor at the starting phase of the Dariali Project.

Peri LLC will backfill pipeline and reinstate the corridor as far as practicable, after installation of the pipeline.

Photo below shows backfilled pipeline and slopes installed as extent feasible. This practice will be used at entire length of pipeline. Natural re-vegetation is considered to be sufficient to restore

the slopes cover. Re-vegetation process will be monitored and if there will be lack of re-vegetation, grass seeding will be performed next year.

Excessive excavated materials from the opposite side of road slopes will be used for pipeline backfilling and the slope will be shaped extent feasible.

Installation of the pipeline was completed: entire length was backfilled and the corridor reinstated as far as practicable.Natural re-vegetation was considered to be sufficient to restore the slopes cover. A slight vegetative cover is forming from the annual grass growing on the slopes above and a small annual grass species. Monitoring should be continued.

5. Cable Portal Entrance

Area at cable portal should be cleaned of waste and debris; oil spills; useless construction materials etc. should be cleaned. Drainage control should be maintained. Existing electrical cables to be renewed and installed as required.

Storm water drainage channels installation should be taken in consideration while reinstatement activities will be carried out.

Stones will be protected by metal mesh to avoid falling hazards.

Area at cable portal wascleaned of waste and debris; oil spills; useless construction materials etc. Drainage control is maintained. Temporaryand improperly installed electrical cables were removed. Final landscaping activities have been started.

Stones accumulated in the ravine beside of access tunnel were protected by metal wire mesh and gabion wall. This significantly decreased falling hazard, however as rockfall potential is inherent in these areas and on main public road which is only access and connection of the project headwork and PowerStation facilities, additional caution should be taken when moving across unprotected areas.

6. Camp Site Reinstatement

Camp site reinstatement should be performed after site clearance. Temporary facilities will be removed, parking area and truck maintenance area will be cleared from minor spills. Area will be leveled and drainage channels will be installed. Natural re-vegetation should be monitored. Seeding will be performed if required.Disturbed areas will be reinstated to a condition as good, if not better than that that existed prior to establishment of the facilities, and will be to the satisfaction of the owner/authority.

Commencement of reinstatement at camp site is expected after completing all other activities under the project. According contractor early summer of the next year is considered as winter associated natural events may hamper the reinstatement works.

7. Surface Drainage and Reinstatement

Surface drainage lines will be reinstated to match the existing formations (ephemeral creeks) and contours as soon as practicable (i.e. the period following removal of surface facilities / infrastructure and backfilling or compaction) to ensure any works completed will not be affected by a rainfall event or over a longer summer rainfall period. Most surface drainage lines occur with areas of greater slope so extra measures are required for erosion control and soil establishment. Rock armoringmay be required at drainage outlets and along drainage lines with significant flow, to avoid scoured erosion issues. The need for rock armoring, or other engineered sediment and erosion controls, will be determined by a suitably qualified person, such as a certified practicing engineer.

Surface contouring reinstates the pre-construction land formation to the natural contours of theexisting environment. This ensures water flow over the surface is in cohesion with the

surroundinglandscape and minimizes the risk of potential erosion. Contouring will payparticular attention to drainage lines for surface waterflows to ensure erosion potential is minimized.

Major part of surface drainage lines was reinstated.