

## 10. CONCLUSIONS AND RECOMMENDATIONS

### 10.1 INTRODUCTION

10.1.1 This EIA report and associated Appendices have:

- provided the background to the Qatalum Project;
- outlined the legal framework and standards/guidelines that have been considered;
- presented a description of the Project, its alternatives and its emissions;
- identified potential environmental impacts;
- described the environmental and social baseline environment;
- assessed environmental and social impacts and described the mitigation measures in place and those proposed to reduce any impacts;
- identified issues within the Project that require further development and definition;
- provided an overview of environmental and social management for the Project, including proposed monitoring plans; and
- presented a summary of the impact assessment outcomes.

10.1.2 This Chapter aims to:

- summarise the main findings of impact assessment process;
- provide a single list of any key further studies / evaluations that will be prepared and submitted in addition to the EIA, prior to construction / operation; and
- present a consolidated list of main recommendations.

### 10.2 ENVIRONMENTAL IMPACT ASSESSMENT

10.2.1 The potential environmental impacts for the construction / commissioning and operation of the Qatalum Project were identified in Table 4.1. Impacts have been assessed with particular reference to the baseline data of the key environmental components identified in the baseline description (Chapter 5). Assessment techniques have used internationally accepted methodologies and, for emission sources, have been based on the source-pathway-receptor model.

10.2.2 The assessment has ranked impacts in terms of their potential significance (e.g. “major, moderate, minor and negligible” as follows:

- **Major:** substantial adverse changes in an ecosystem<sup>xxii</sup>, society, or economy. Changes are well outside the range of natural variation and unassisted recovery could be protracted.
- **Moderate:** moderate adverse changes in an ecosystem, society, or economy. Changes may exceed the range of natural variation. Potential for recovery within

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<sup>xxii</sup> The term ‘ecosystem’ can be taken to mean the physical environment and the biological communities that live within that environment. Typically impacts to populations and communities are considered rather than impacts to individuals.

several years without intervention is good; however, it is recognised that a low level of impact may remain.

- **Minor:** minor adverse changes in an ecosystem, society or economy. Changes might be noticeable, but fall within the range of normal variation. Effects are short-lived, with unassisted recovery occurring in the near term; however, it is recognised that a low level of impact may remain.
- **Negligible:** changes in an ecosystem, society, or economy that are unlikely to be noticeable (i.e., well within the scope of natural variation)
- **Beneficial:** changes resulting in positive, desirable, or beneficial effects on an ecosystem, society, or economy

10.2.3 A summary of the impacts identified, the key mitigation / control measures and the significance of the resulting (residual) impacts is Table 9.1.

10.2.4 The focus of the EIA has been Phase 1 of the Qatalum Project, since prior to any future expansion projects, a full EIA will be undertaken and submitted to SCENR in accordance with Qatari requirements. The cumulative impacts of planned, approved developments have been considered in the assessment so far as this is possible.

10.2.5 Several alternative port solutions have been, and are still, under consideration at the stage of finalising the EIA. Due to schedule constraints, these alternatives have been described in outline form and the resultant impacts have been assessed only at a screening level.

10.2.6 For the potential impacts assessed, the majority were determined to have only negligible or minor significance. This largely reflects the careful design of the plant, the operational controls and the mitigation measures that will be implemented.

10.2.7 Only two impacts were rated as having a moderate significance for operation of the plant and these relate to elevated ground level concentrations of PM<sub>10</sub> and ozone.

10.2.8 PM<sub>10</sub> emissions are only considered to have a moderate significance on the basis of the existing high background concentrations; the contribution from the Qatalum Project alone is assessed as negligible. The high concentrations of particulate fractions are not atypical of an arid environment, such as MIC and the Qatar peninsula in general. Although no particle morphology has been determined, it is likely that the majority of background particulates are of non-anthropogenic (mineral) origin. The SCENR criteria make no derogation for particulates of mineral origin; however, for areas with this type of climate, there are few, if any, practicable measures for controlling non-anthropogenic dust sources.

10.2.9 The modelled PM<sub>10</sub> process contribution for annual and daily average concentrations in the residential area are less 1% and 3% respectively, of the SCENR criteria. PM<sub>10</sub> emissions have been minimised as far as possible and are in accordance with the principles of BAT (as indicated by the modelling results), even if the Qatalum Project did not emit any PM<sub>10</sub> there is every indication that PM<sub>10</sub> criterion would still be exceeded. No further mitigation / control measures can be applied.

- 10.2.10 The Qatalum Project will not directly emit ozone to the atmosphere; however it will generate ozone precursors. The main potential ozone precursors associated with the Qatalum Project, have been minimised at source through the application of BAT, as described in Section 3.12. Although the Qatalum project has minimised compounds with the potential to result in ground level ozone creation so far as it possible, ambient air quality data show that the SCENR standards are already exceeded within MIC; thus any impact arising from the potential increase in ozone concentrations has been rated as having a moderate significance. Qatalum are hoping to participate in the second phase of the QP/Total regional ozone monitoring study; the results of this may give a better indication of the significance of the Qatalum Project's likely contribution to this issue.
- 10.2.11 Two impacts relating to dredging for the Original Port concept have been assigned a significance rating of moderate. These impacts correspond to direct loss of / damage to seagrass beds as a result of the physical disturbance of the seabed and indirect loss of / damage to seagrass beds as a consequence the re-suspension of sediment, leading to smothering and turbidity increases. The loss of habitat through physical disturbance cannot be directly mitigated against and compensatory measures for loss of the seagrass area may be considered if the Original Port concept is pursued.
- 10.2.12 Loss or damage to the seagrass beds as a result of re-suspension of sediment can be controlled. Dredging will be undertaken in accordance with the principles of BAT and good international practice. The dredge Contractor will develop and implement a specific EMP for dredging, which will be agreed with SCENR. Generic mitigation measures have been suggested in Section 6.5 and a monitoring plan has been proposed in Chapter 8. Without the opportunity to review the final EMP for dredging this impact has been assessed as moderate; however, if the EMP contains all the measures discussed the impact significance could be reduced to minor.
- 10.2.13 One impact was rated as having a minor to major significance. This relates to the potential contamination of seawater and sediment and subsequent impacts on marine ecology as a result of the re-suspension of contaminated sediments for the Alternative Port Area. Previous surveys have indicated that at least some of the possible dredge areas could be contaminated with metals and TPH. Mitigation measures have been suggested in Section 6.5 and a monitoring plan has been proposed in Chapter 8. As above, without the opportunity to review the final EMP for dredging, and without the results of the proposed pre-dredge survey, this impact has been assessed conservatively. If the EMP contains all the measures and monitoring discussed, the impact significance could be reduced to minor.
- 10.2.14 All other impacts identified for construction, commissioning and operation were determined to have only negligible or minor significance.
- 10.2.15 The overall conclusion of this assessment is that impacts have been minimised, and will be managed, as far as is reasonably possible. None of the impacts identified are so severe that they should affect the overall implementation of the Project.

### 10.3 SOCIAL IMPACT ASSESSMENT

10.3.1 The social impact assessment concluded that, overall, the social impacts associated with the Qatalum Project were determined to be positive for the local population and the country as a whole. None of the social issues identified in the SIA report are so serious as to affect implementation of the Project.

### 10.4 RECOMMENDATIONS

10.4.1 A series of suggestion and recommendations have been made throughout the previous Chapters of this report; these are listed below. The list does not include recommendations that have been incorporated into the monitoring plans in Chapter 8, nor does it include recommendations that would be expected to be fulfilled as part of the further studies / evaluations listed below. Recommendations resulting from the SIA are presented in Section 7.5.

- Qatalum should continue communication with QP/Total, regarding involvement in the second phase of the ozone modelling study for Qatar;
- prior to start-up of the plant, further investigation of Aloe vera, canna lily and date palm should be considered to determine their suitability as bio-indicators of fluoride emissions at MIC;
- the potential accident scenarios identified in the environmental risk assessment should be incorporated into the Qatalum EMS; and
- an emergency response plan (ERP), including procedures, should be prepared; the plan should include any plans for post-incident environmental monitoring and should be agreed with the MIC and SCENR prior to full operation.

### 10.5 FURTHER STUDIES / EVALUTIONS

10.5.1 As described in the previous Chapters of this report, certain studies / evaluations will be prepared and submitted in addition to this EIA report. Similarly, further discussions are required for certain issues. The studies and outcome of key discussions will be submitted at a later date, but prior to construction / operation (as relevant); the main aspects of further communications are expected to include:

- further details relating to the Qatalum Port Concept and the source of fill materials (including transport issues) will be submitted when selection decisions have been finalised and the engineering works are more advanced;
- the outcome of the discussions that will be undertaken with QASCO MIC Authority relating to establishing a communication system regarding the discharge channel and the legalities and split of responsibilities from a regulatory perspective;
- Master HSE Management Plan for construction;
- EPC Contractors' general construction / commissioning EMPs, including monitoring plans;
- specific EMP for managing and monitoring dredging activities;
- agreement of the construction Traffic Management Plan (TMP) with MIC;

- discussions with SCENR to agree a threshold level for suspended solids from dredging activities and dewatering;
- details of the Qatalum HSE programme;
- further details relating to the Qatalum EMS, including a detailed waste management strategy for operational waste streams giving final confirmation of disposal routes / recycling options;
- discussions and agreements with SCENR, prior to the initiation of operational monitoring, relating to: monitoring methodology; monitoring frequency and programme; and reporting format and frequency;
- discussion with MIC relating to the use / installation of boreholes for monitoring groundwater at the Main Site and an agreed monitoring programme (prior to the commencement of full production);
- agreements with MIC relating to monitoring sanitary effluents;
- a full safety risk assessment, in accordance with Hydro and QP's procedures - the study will address the findings and recommendations from the preliminary QRA; and
- discussions with SCENR relating to possible compensatory measures.