

Proposed Expansion of Rodrigues Airport Draft Environmental and Social Impact Assessment Report

VOLUME 3 OF 3

Report prepared for Airport of Rodrigues Ltd.



Report prepared by Setec / Reference - 090-53501



27 January 2023

Report Compilation 2018 & 2022

NAME	ROLE	COMPANY
ENVIRONMENTAL CONSULTANT TEAM		
Frederic TRANQUILLE	Project Director	SETEC (Mauritius) Ltd
Mailys DELHOMMEAU	Project Manager (2018)	SETEC INTERNATIONAL
Nadia DABY SEESARAM	Project Manager (2022)	ENVIRO-CONSULT LTD
SPECIALIST TEAM		
Antoine MARIE / Christophe HOUISE	Marine Biodiversity	SETEC HYDRATEC SETEC IN VIVO
Pierre-Yves FABULET	Terrestrial Biodiversity	ECO-MED
Veenoy DABEE	Geological & Geotechnical	SETEC (Mauritius) Ltd Geotechnical Engineer - Independent Consultant
Sophie MERAT / Camille DURAN	Hydrology / Stormwater Drainage	SETEC (Mauritius) Ltd SETEC HYDRATEC
Marc ETIENNE	Hydrogeology	SETEC (Mauritius) Ltd Hydrogeologist – Independent Consultant
Fatou DIAGNE / Frédéric TRANQUILLE	Potable Water / Waste water	SETEC HYDRATEC
	Solid Waste	SETEC ENERGIE ENVIRONNEMENT
Luigi ARNALDI/Yasmine OUADI	Cultural Heritage	INSUCO
Luigi ARNALDI/Yasmine OUADI	Social & Economic	INSUCO
Marieme MBOUP FALL	Traffic and Transport	SETEC INTERNATIONAL
	Air Quality	SETEC INTERNATIONAL & specialist sub-consultants
	Noise	SETEC INTERNATIONAL & specialist sub-consultants
	Visual & Landscaping	SETEC INTERNATIONAL & specialist sub-consultants

Table of contents

0	Glossary.....	17
---	---------------	----

Volume 1

1	Non-Technical Executive Summary.....	19
1.1	Introduction.....	19
1.2	Project description.....	19
1.3	Environmental and social baseline conditions.....	20
1.3.1	Physical environment.....	20
1.3.2	Biological environment.....	28
1.3.3	Transport network, electricity supply and waste management.....	38
1.3.4	Social environment.....	39
1.3.5	Air quality and noise.....	44
1.3.6	Heritage resources and visual environment.....	46
1.4	Summary of the Stakeholder Engagement Plan.....	47
1.4.1	Engagement activities conducted prior to the ESIA.....	47
1.4.2	Presentation of the consultations performed during the ESIA.....	49
1.4.3	Stakeholder engagement activities to be conducted.....	50
1.5	Potential impacts and measures.....	50
1.5.1	Temporary impacts during works phase.....	51
1.5.2	Permanent and irreversible impacts during works phase.....	55
1.5.3	Permanent impacts during operation phase.....	61
1.6	Environment and social management plans for construction phase.....	65
1.6.1	Environmental Management Plan for the construction phase.....	65
1.6.2	Social Management Plan for the construction phase.....	80
1.7	Environment and social management plans for operation phase.....	93
1.7.1	Environment Management Plan for operation phase.....	93
1.7.2	Social Management Plan for the operation phase.....	99
1.8	Cumulative Impact Assessment.....	106
1.9	Scope of Studies for the finalisation of the ESIA Report.....	107
2	Terms of Reference & Methodology for Updating the ESIA.....	108
2.1	Terms of Reference for Consultancy Services to Update an Environmental and Social Assessment for the Expansion of the Rodrigues Airport Project.....	108
2.1.1	Introduction.....	108
2.1.2	Objectives of the Assignment.....	108
2.1.3	Relevant Standards and Legal Requirements.....	109
2.1.4	Scope of Work.....	109
2.2	Methodology for updating the ESIA.....	109
2.2.1	Draft ESIA.....	110
2.2.2	Final ESIA.....	114
3	Introduction.....	130
3.1	The ESIA 2019.....	130
3.2	The ESIA Update 2022/2023.....	130

3.2.1	The World Bank Context	130
3.2.2	The Project Status.....	132
3.3	Environmental and Social Standards applicable to the project.....	132
4	Legal and institutional framework	133
4.1	National legal requirements	133
4.1.1	The Environment Protection Act 2002	133
4.1.2	Legislation on land acquisition, compensation, resettlement	136
4.1.3	Other main applicable legislation.....	137
4.1.4	Legal requirements about gender and gender-based violence	139
4.2	Rodrigues Sustainable Integrated Development Plan	140
4.3	Water Development Strategies	140
4.4	International standards	140
4.4.1	International Guidelines for Environment and Social Standards	140
4.4.2	International Conventions and Treaties	141
5	Project description and justification.....	143
5.1	Introduction to the project and background information.....	143
5.1.1	Project objective.....	143
5.1.2	Brief history of the project.....	143
5.1.3	Studies received since ESIA 2019	145
5.1.4	Studies under-way and way forward for the project	145
5.2	Project Time Line and Milestones.....	146
5.3	Description of the projected infrastructures and airport management	146
5.3.1	Scope of works	146
5.3.2	Runway	150
5.3.3	Taxiways	152
5.3.4	Apron	157
5.3.5	Air Traffic Control Tower and facility (updated 2022)	158
5.3.6	Rescue and Fire Fighting Services (updated 2022).....	161
5.3.7	Ancillary Facilities within the Scope of Phase 1 Airport Expansion	164
5.3.8	Ancillary Facilities within the Scope of Phase 2 Airport Expansion	165
5.3.9	Water tower.....	165
5.3.10	Stormwater drainage and domestic wastewater management facilities	166
5.4	Cost and investment.....	185
5.5	Projected traffic.....	186
5.5.1	Passengers traffic	186
5.5.2	Air traffic.....	187
5.5.3	Cargo	188
5.6	Construction Activities	190
5.6.1	Earthworks and construction above voids	190
5.6.2	Demolitions	190
5.6.3	Marine works.....	190
5.6.4	Works main facilities	191
5.7	Ancillary facilities	192
5.7.1	Ground service equipment	192
5.7.2	Security.....	192
6	Environmental and social baseline conditions	194

6.1	Scoping and methodology	194
6.1.1	Scoping	194
6.1.2	Baseline issues assessment methodology (receptor sensitivity).....	194
6.2	Area of Influence	195
6.3	Physical environment.....	197
6.3.1	Area of influence	197
6.3.2	Geographical overview.....	197
6.3.3	Climate and marine and terrestrial meteorological conditions.....	200
6.3.4	Climate Change Projections.....	220
6.3.5	Terrestrial geology and geotechnics.....	220
6.3.6	Marine and shores geology and marine turbidity	237
6.3.7	Hydrology.....	243
6.3.8	Hydrogeology.....	251
6.3.9	Water resource and waste water management	264
6.3.10	Summary: Physical environment sensitivity.....	273

Volume 2

6.4	Biological environment.....	274
6.4.1	Terrestrial biological context.....	274
6.4.2	Marine biological context.....	324
6.4.3	Summary: Biological environment sensitivity.....	345
6.5	Transport network, electricity supply and waste management	346
6.5.1	Area of influence	346
6.5.2	Transport network	346
6.5.3	Electricity supply	349
6.5.4	Solid waste management.....	349
6.5.5	Summary: Transport, electricity supply and waste management sensitivity.....	351
6.6	Social environment.....	352
6.6.1	Methodology and area of influence of the socio-economic study.....	352
6.6.2	Administration and Governance of Rodrigues Island.....	360
6.6.3	Demographic and local governance	365
6.6.4	Access to basic public services	373
6.6.5	The local economy	378
6.6.6	Summary: Social environment sensitivity	396
6.7	Air quality and noise environment.....	397
6.7.1	Area of influence	397
6.7.2	Demography and exposed population	397
6.7.3	Air quality and carbon footprint.....	399
6.7.4	Noise.....	415
6.7.5	Summary: air and noise sensitivity	430
6.8	Heritage resources and visual environment.....	431
6.8.1	Area of influence	431
6.8.2	Cultural heritage resources	431
6.8.3	Archaeology and palaeontology	432
6.8.4	Landscape and visual environment	432

6.8.5	Summary: cultural and visual environment sensitivity.....	438
6.9	Conclusion: main issues of the baseline	452

Volume 3

7	Preliminary environmental, social impacts and mitigation measures.....	453
7.1	Definitions and methodology.....	453
7.1.1	Project's phase considered in this study.....	453
7.1.2	Methodology for impact assessment and rating.....	453
7.1.3	Methodological specificities for certain themes.....	454
7.2	Temporary Impacts during Construction	459
7.2.1	Physical environment	459
7.2.2	Biological environment	478
7.2.3	Transport network, electricity supply and waste management.....	488
7.2.4	Socio-economic environment	491
7.2.5	Air quality and noise	520
7.2.6	Heritage resources and visual environment.....	524
7.3	Permanent and irreversible impacts during Construction Phase	528
7.3.1	Physical environment	528
7.3.2	Biological environment	545
7.3.3	Transport network, electricity supply and waste management.....	597
7.3.4	Socio-economic environment	597
7.3.5	Air quality and noise	616
7.3.6	Heritage resources and visual environment.....	616
7.4	Impacts during operation phase.....	619
7.4.1	Physical environment	619
7.4.2	Biological environment	633
7.4.3	Transport network, electricity supply and waste management.....	636
7.4.4	Socio-economic environment	639
7.4.5	Air quality and noise	659
7.4.6	Heritage resources and visual environment.....	668
8	Project alternatives.....	678
8.1	Brief description of the approach to designing the best development solution	678
8.2	« Doing nothing »: maintain the current arrangements for the foreseeable future ..	678
8.3	Improving the current situation by facilitating the unrestricted operation of the ATR72 aircraft.....	679
8.4	Extension on the sea to the west.....	679
8.5	Resumption of studies to design a new runway to the southeast and Preliminary design.....	682
8.5.1	New runway options.....	682
8.5.2	Preliminary Design optimization and new options.....	688
9	Preliminary Environmental and Social Management Plan (ESMP) for the construction phase	691
9.1	Preliminary Environment Management Plan for the construction phase	691
	Environmental Management Plan for the construction phase	691
9.1.1	691	691

- 9.1.2 Environment Management Plans to be implemented for the construction phase
703
- 9.1.3 Emergencies management plans717
- 9.1.4 Summary of plans to be drawn up for environmental management during the
construction phase723
- 9.2 Preliminary Social Management Plan for construction phase.....725
 - 9.2.1 Preliminary Social Management Plan for construction phase725
 - 9.2.2 Preliminary Social Management Plans to be implemented for the construction
phase or prior to the works734
 - 9.2.3 Summary of plans to be drawn up for social management during the construction
phase 749
- 10 Environmental and Social Management Plan (ESMP) for the operational phase753
 - 10.1 Environment Management Plan for operational phase.....753
 - 10.1.1 Environmental Management Plan for operational phase753
 - 10.1.2 Environment Management Plans to be drawn up in operational phase758
 - 10.1.3 Emergencies prevention and management plans.....764
 - 10.1.4 Summary of plans to be drawn up for environmental management during the
operational phase.....768
 - 10.2 Social Management Plan for operational phase.....770
 - 10.2.1 Social Management Plan for operational phase770
 - 10.2.2 Social Management Plans to be implemented for the operational phase.....774
 - 10.2.3 Summary of plans to be drawn up for social management during the the
operational phase.....782
- 11 Cumulative Impact Assessment785
 - 11.1 Introduction.....785
 - 11.2 Identification of Valued Environmental and Social Components786
 - 11.3 Spatial and Temporal Boundaries.....787
 - 11.3.1 Spatial Boundary.....787
 - 11.3.2 Temporal Boundary.....787
 - 11.4 Assessing Cumulative Impacts on VECs787
 - 11.4.1 With regard to the increase in tourist flows787
 - 11.4.2 About the possible demographic evolutions787
 - 11.4.3 Assessment of the increase in pressure on the island's resources and services
787
 - 11.4.4 Assessment of the possible increase in pressure on critical habitat788
 - 11.4.5 Evaluation of the institutional framework and the capacities of the regional
administration to respond to the increase in demand for goods and services resulting from
the increase in flows to the island.788
 - 11.5 Assessing the Carrying Capacity of the Island.....788
- 12 Estimated costs of the environmental management789
 - 12.1 Environment measures costs.....789
 - 12.1.1 Construction phase789
 - 12.1.2 Operation phase.....804
 - 12.2 Social measures costs.....810
- 13 References.....816
 - 13.1 Physical environment.....816



13.1.1	Climate and meteorological conditions	816
13.1.2	Geology and geotechnics	816
13.1.3	Marine and shores geology and marine turbidity	817
13.1.4	Hydrology	818
13.1.5	Hydrogeology	818
13.1.6	Water resource and waste water management	820
13.2	Biological environment.....	820
13.2.1	Terrestrial biological environment.....	820
13.2.2	Marine biological environment.....	821
13.3	Social environment	821
13.4	Air quality and noise	822
13.5	Heritage resources and visual environment	822
13.5.1	Cultural heritage resources	822
13.5.2	Archeology and paleontology	822
13.5.3	Landscape and visual environment	822
14	Appendices	823
14.1	Stakeholder Engagement Plan	823
14.1.1	Legislative and regulatory framework	823
14.1.2	Approach for the analysis and planning of the engagement of the stakeholders 825	
14.1.3	Identification and analysis of the stakeholders	829
14.1.4	Stakeholder consultation: a summary of perceptions of the project	834
14.1.5	Stakeholder engagement strategy	842
14.1.6	Complaint and grievance management mechanism	845
14.1.7	Monitoring and reports of activities in which stakeholders are engaged	848
14.1.8	Conclusion	849
14.1.9	Annexes of the stakeholder engagement plan.....	849
14.2	Questionnaire for socio-economics study	879
14.3	Melbourne Airport Emergency Plan	883

LIST OF TABLES

Table 1: Physical Environment Sensitivity.....	27
Table 2: Habitat types recorded in the area of influence (ESIA 2018).....	30
Table 3: Native flora recorded in the area of influence and sensitivity assessment	31
Table 4: List of ecological continuities included within the area of influence.....	34
Table 5: Summary of Biological Environmental Sensitivity	37
Table 6: Summary of Social and Economic Sensitivity	44
Table 7: Summary of Air and Noise Sensitivity	46
Table 8: Summary: cultural and visual environment sensitivity.....	47
Table 9: Summary of Temporary impacts during works phase.....	51
Table 10: Summary of Permanent and Irreversible Impacts during Works phase.....	55
Table 11: Summary of Permanent Impacts during Operation Phase.....	61
Table 12: Environmental Management Plans for Construction Phase	65
Table 13: Summary of Environmental Measures and Monitoring for Construction Phase	68
Table 14: Social Management Plans for Construction Phase	80
Table 15: Summary of Social Measures and Monitoring for Construction Phase.....	85
Table 16: Environmental Management Plans for Operation Phase	93
Table 17: Summary of Environmental Measures and Monitoring during Operation Phase	95
Table 18: Social Management Plan during Operation Phase	99
Table 19: Summary of Social Measures and Monitoring during Operation Phase	105
Table 20: Draft ESIA update - Corrections and Amendments to the existing ESIA.....	110
Table 21: Most Relevant conventions/treaties	141
Table 22: Statistic passenger arrivals	186
Table 23: Forecast of passenger arrivals	186
Table 24: Forecast aircraft departures	187
Table 25: Average percentage of annual passenger departures per Month.....	188
Table 26: Forecast Aircraft Departures for 2021 – passenger traffic	189
Table 27: Receptor sensitivity	195
Table 28: Circulation pattern in the lagoon and at Plaine Corail.....	207
Table 29: Characteristics of Rodrigues’ tide gauge.....	212
Table 30: Port Mathurin, Inner Harbour, Admiralty Tide Tables harmonic amplitudes and phases (2002 analyses)	212
Table 31: Tropical cyclone naming in the SW Indian Ocean (Mauritius Meteorological Service and Meteo France)	214
Table 32: Tropical disturbance events in the vicinity of Rodrigues Island [1962 - 2019].....	216
Table 33: Sea level at Port Mathurin for the major cyclones impacting Rodrigues.....	219
Table 34: Summary of In situ and Laboratory Data of Calcarenites, Breccias and Basalts Formations	230
Table 35: General characteristics of beaches in Rodrigues.....	237
Table 36: Hydrogeological receptors sensitivity	263
Table 37: Water production for 2017/ 2022.....	264
Table 38: Data table of the water consumption for Airport of Rodrigues Limited for the year 2017 ...	269
Table 39: Physical environment sensitivity.....	273
Table 40: Scale value used to assess the plant species sensitivity	276
Table 41: Habitat types recorded at the area of influence	278
Table 42: Summary of the plant species status listed in the area of influence	284
Table 43: List of plant species recorded on site (purple background: species recorded inside the project footprint) and sensitivity assessment for native species	290
Table 44: Native flora recorded in the area of influence and sensitivity assessment	293
Table 45: List of mammals observed on site.....	302

Table 46: List of reptiles observed on site	304
Table 47: List of birds observed on site.....	307
Table 48: List of molluscs observed on site	309
Table 49: List of crustaceans observed on site	309
Table 50: List of insects observed on site	310
Table 51: List of arachnids observed on site.....	313
Table 52: List of myriapods observed on site.....	313
Table 53: Scale value used to assess the plant species sensitivity	314
Table 54: Native fauna recorded at the area of influence and sensitivity assessment	315
Table 55: Fauna conservation issues inside the area of influence	316
Table 56: List of ecological continuities included within the area of influence	318
Table 57: List of protected plant species in Rodrigues (Source: Rodrigues Regional Assembly, 2019): (in red, species recorded inside the area of influence; in yellow background: species recorded inside the project footprint).....	321
Table 58: Biological environment sensitivity.....	345
Table 59: Transport, electricity supply and waste management sensitivity	351
Table 60: Summary of the number of households interviewed per site	356
Table 61: Crew organization on net fishing vessels.....	380
Table 62: Main food production in Rodrigues in 2017 and shares of agricultural land	389
Table 63: Social environment sensitivity	396
Table 64: Description of main air pollutants	399
Table 65: Air Quality regulations	400
Table 66: WHO Ambient air quality guidelines (2005)	402
Table 67: Meteorological Data , Plaine Corail.....	404
Table 68: aircraft movements recorded during the air quality measurement	405
Table 69: Duration and engine speed associated with the different phases of LTO cycle	413
Table 70: Gas emissions and fuel consumption per year	414
Table 71: Meteorological Data at Plaine Corail	418
Table 72: aircraft movements recorded during the air quality measurement.....	420
Table 73: overall noise levels measured	420
Table 74: air and noise sensitivity	430
Table 75: cultural and visual environment sensitivity	438
Table 76: Impact severity	454
Table 77: Magnitude matrix of social impacts	454
Table 78: Marine water quality model - Process parameters.....	460
Table 79: Results from the marine water quality model	461
Table 80: Thickness of deposit due to the construction of the runway in the surrounding of Plaine Corail	464
Table 81: Temporary Impact during Construction - Physical Environment.....	466
Table 82: Temporary Impact during Construction – Physical Environment Karstic System.....	473
Table 83: Temporary Impact during Construction – Physical Environment - Water & wastewater	477
Table 84: Temporary Impact during Construction - Biological Environment - Marine Habitats	483
Table 85: Temporary Impact during Construction - Biological Environment - Marine Species.....	487
Table 86: Temporary Impact during Construction - Transport Network, Electricity Supply & Waste Management.....	490
Table 87: Temporary Impact during Construction - Socio-Economic Environment - demographics and social dynamics	495
Table 88: Temporary Impact during Construction - Socio-Economic Environment - Power, Governance & Civil Society.....	497
Table 89: Temporary Impact during Construction - Socio-Economic Environment - Land.....	500

Table 90: Temporary Impact during Construction - Socio-Economic Environment - Agriculture & Livestock.....	505
Table 91: Temporary Impact during Construction - Socio-Economic Environment - Local Economy	512
Table 92: Temporary Impact during Construction - Socio-Economic Environment - Health & Safety of the Community.....	516
Table 93: Temporary Impact during Construction - Socio-Economic Environment - Health & Safety of Workers	519
Table 94: Temporary Impact during Construction - Air Quality	521
Table 95: Temporary Impact during Construction - Socio-Economic Environment - Noise.....	523
Table 96: Temporary Impact during Construction - Landscape & Visual Environment	527
Table 97: Differential of circulation due to the constructed runway.....	530
Table 98: Marine sediment model inputs	532
Table 99: Impact on sediment deposit due to the construction of the Runway.....	533
Table 100: Permanent Impact during Constructon - Physical Environment - Marine	535
Table 101: Permanent Impact during Constructon - Physical Environment - Hydrology	537
Table 102: Permanent Impact during Construction - Physical Environment - Karstic Environment ...	541
Table 103: Permanent Impact during Construction - Physical Environment - Water & Wastewater ..	544
Table 104: Targeted plant species	564
Table 105: Permanent impact during Construction - Biological Environment – Terrestrial Habitat ...	571
Table 106. Number of native flora specimens destroyed by the project	573
Table 107: Permanent impact during Construction - Biological Environment - Terrestrial Flora	583
Table 108: Permanent impact during Construction - Biological Environment - Terrestrial Fauna	591
Table 109: Permanent impact during Construction - Biological Environment - Marine Habitats	594
Table 110: Permanent impact during Construction - Biological Environment - Marine Species.....	596
Table 111: Permanent impact during Construction - Socio-Economic Environment - Demographics & Social Dynamics	601
Table 112: Permanent impact during Construction - Socio-Economic Environment - Land.....	605
Table 113: Permanent impact during Construction - Socio-Economic Environment - Agriculture & Livestock.....	609
Table 114: Permanent impact during Construction - Socio-Economic Environment - Fishing	613
Table 115: Permanent impact during Construction - Socio-Economic Environment - Community Mobility	615
Table 116: Permanent impact during Construction - Visual & Landscaping	618
Table 117: Impact during Operation - Physical Environment- Marine Environment	621
Table 118: Impact during Operation - Physical Environment- Hydrology	626
Table 119: Impact during Operation - Physical Environment- Karstic Environment	629
Table 120: Impact during Operation - Physical Environment- Water & Wastewater	632
Table 121: Impact during Operation - Biological Environment – Marine Habitats	635
Table 122: Impact during Operation – Transport Network, Electricity Supply & Waste Management	638
Table 123: Impact during Operation - Socio-Economic Environment – power, governance and civil society.....	640
Table 124: Impact during Operation - Socio-Economic Environment – Land.....	643
Table 125: Impact during Operation - Socio-Economic Environment – Agriculture & Livestock	648
Table 126: Impact during Operation - Socio-Economic Environment – Local Economy	655
Table 127: Impact during Operation - Socio-Economic Environment – living environment & Landscape	657
Table 128: Emissions inventory.....	659
Table 129: Impact during Operation - Air Quality	661
Table 130: Noise exposure within Lden contours	664
Table 131: Impact during Operation - Noise	667

Table 132: Impact during Operation - Visual Environment & Landscape	672
Table 133: Overall Environmental Management Plan for the construction phase	702
Table 134: Summary of Required ESMP– Environmental Plans - Construction Phase	723
Table 135: Overall Social Management Plan for construction phase	733
Table 136: Summary of Required ESMP– Social Plans - Construction Phase	749
Table 137: Overall Environmental Management Plan for operational phase.....	757
Table 138: Summary of Environmental Management Plan for operational phase.....	768
Table 139: Overall Social Management Plan for operational phase	773
Table 140: Summary of Social Management Plans for operational phase	782
Table 141: ESMP Cost Estimate Construction Phase - Environmental Aspects	803
Table 142: ESMP Cost Estimate Operation Phase - Environmental Aspects	809
Table 143: ESMP Cost Estimate Construction Phase - Social Aspects	815
Table 144: Names and demographics of villages and areas of activity affected by the project	826
Table 145: List and typology of stakeholders	830

LIST OF FIGURES

Figure 1: Area of influence (to be updated at final ESIA stage)	21
Figure 2: Area of influence – Terrestrial Biodiversity	29
Figure 3: Vegetation and habitat types mapping.....	32
Figure 4: Endangered and threatened plant species map	33
Figure 5: Area of influence for Marine biodiversity	36
Figure 6: Area of influence of the Rodrigues Airport Extension Project	40
Figure 7: Rodrigues Regional Assembly (RRA) organizational chart	41
Figure 8: Rodrigues Council of Social Services (RCSS) organizational chart	42
Figure 9: Access to basic public services (health, education) in the project area	43
Figure 10: Building location map and area of influence	45
Figure 11: Alignment of Option C (Dec 2017)	144
Figure 12: Updated Master Plan (ARL, Nov. 2022).....	148
Figure 13: Existing infrastructures and projected facilities (to include the river and estuary)	149
Figure 14: Turn pad on the 30 end of the runway – to be updated based on final design.....	151
Figure 15: Taxiways Alpha, Bravo and Charlie (Preliminary Design Report) – to be updated based on final design.....	154
Figure 16: Taxiway Echo (Preliminary Design) – to be updated based on final design.....	155
Figure 17: Updated Architectural Drawings of the ATC (Preliminary Design)	160
Figure 18: Rescue and Fire Fighting Services – South Elevation (updated 2022)	161
Figure 19: Sea Rescue Facility – GF plan and Section A-A (updated 2022).....	163
Figure 20: General principle proposed for the integrated water management envisaged	169
Figure 21: Tentative location of the buffer storage envisaged for the stormwater management.....	170
Figure 22: General principle proposed for the water treatment plant.....	176
Figure 23: Example of the filtration bag technology proposed for the sludge treatment on site	178
Figure 24: Zones for rainwater/stormwater collection for treatment and reuse.....	180
Figure 25: Schematic diagram of the stormwater network.....	183
Figure 26: Projected watershed and stormwater network.....	184
Figure 27: Area of influence (to be updated at final ESIA stage)	196
Figure 28: Geographical overview of Rodrigues Island	198
Figure 29: Topography of the area of influence	199
Figure 30: Flow [a] and Wave [b] computational grids	201
Figure 31: Wind distribution rose (coming from direction) at 10m at point (-63°12'E 20°S)	202

Figure 32: Schematic representations of identified current branches during summer and winter monsoons	203
Figure 33: Annual current distribution rose (going to direction) in surface	204
Figure 34: Passes and fringing reef enclosing Rodrigues	205
Figure 35: Type of Wave Generation Mechanisms in Mauritius and Rodrigues	208
Figure 36: Annual wave distribution rose (peak direction) coming from direction at point (-63°12'E, 20°S)	209
Figure 37: Hs extreme values at point (-63°12'E, 20°S)	209
Figure 38: Cyclonic extreme Hs values at point (-63°12'E, 20°S).....	210
Figure 39: Significant height and mean direction under mean hydrodynamic conditions and wave significant height for nul (dark blue), light (blue), mean (green) and strong (yellow) wind	211
Figure 40: Empirical probability distribution of total sea surface height at Port Mathurin	213
Figure 41: Sea level trend at Port Mathurin, Rodrigues [1986-2009].....	213
Figure 42: Distribution of Cyclone Types since 1962	215
Figure 43: Geodynamic sketch map of the Mauritius-Rodrigues region	221
Figure 44: Geological map of Rodrigues.....	223
Figure 45: Geology and soils in the area of influence (legend next page)	224
Figure 46: Legend of the geology and soils map of southern part of Rodrigues Island, near Plaine Corail and in the area of influence	225
Figure 47: All ground investigations from Phase B (2017) and Phase C (2018) geotechnical campaign of the restricted area of influence at Plaine Corail (Preliminary Design, 2017).....	227
Figure 48: All ground investigations from Phase B (2017) and Phase C (2018) geotechnical campaign of the restricted area of influence at Plaine Corail (Preliminary Design, 2017).....	228
Figure 49: Voids and cavities identified in the restricted area of influence at Plaine Corail.....	231
Figure 50: Geological long sections through the restricted area of influence at Plaine Corail.....	232
Figure 51: Geological long sections LP1 to LP2	233
Figure 52: Geological long sections LP3.....	234
Figure 53: Spatial distribution and thickness of the main geological formations based on the geological formations encountered in boreholes ground investigations.....	235
Figure 54: Marine sediment field measurement and grain size distribution.	239
Figure 55: Natural turbid plume in Baie Topaze (Google Earth, 25-05-2017)	241
Figure 56: Water catchments	243
Figure 57: Mean annual rainfall – Rodrigues (“Etude d’un programme de lutte contre l’érosion à Rodrigues”, BRGM, ONF, Impact, December 1996).....	244
Figure 58: Rainfall stations. Note: The station “Plaine Corail – R” corresponds to the study area	245
Figure 59: DEM of Rodrigues	246
Figure 60: DEM of Rodrigues (zoom) and flood area for Q100	246
Figure 61: Detailed view of the watersheds and drains of the existing site (topography 2 m planimetric resolution)	247
Figure 62: View south / north of the current runway – April 2019 field visit	248
Figure 63: Extract of the general layout drawing showing the existing drains observed around the apron in front of the passenger terminal building	248
Figure 64: View of the existing drains observed around the apron in front of the passenger terminal building	249
Figure 65: View of the existing drains observed around the apron in front of the passenger terminal building	249
Figure 66: View north/south of the site of the project runway – April 2019 field visit	249
Figure 67: Hydrogeological map (from WRU of Mauritius)	251
Figure 68: Karstic system conceptual model (modified from M. Bakalowicz, hydrosciences Montpellier 2002).....	252

Figure 69: Location of two drilling campaign data sets and groundwater map contour	254
Figure 70: Vertical section of topographic and groundwater level	255
Figure 71: Caves location of the Plaine Corail area	257
Figure 72: Caverne Bouteille orifice and abstraction	258
Figure 73: The pound of Caverne Petit-Lac	259
Figure 74: Grotte Fougère sinkhole view (left picture) and topography (right picture) from Burney and al. (2015)	260
Figure 75: Water network of the island.....	266
Figure 76: Water network in Plain Corail and the restricted area.....	267
Figure 77: Water storage and distribution facilities at the airport passenger terminal building.....	268
Figure 78: Graph of the water consumption for Airport of Rodrigues Limited for the year 2017	269
Figure 79: Extract of the existing rainwater harvesting network.....	270
Figure 80: Extract of the existing wastewater network provided	271
Figure 81: View of the Fuel depot and associated facilities to prevent environmental accidental pollution	272
Figure 82: Area of influence	275
Figure 83: Example of burned vegetation	277
Figure 84: Submersed grass bed of Paspalidium geminata	280
Figure 85: Ecological values of the vegetation on the area of influence	280
Figure 86: Photographic plates of habitat types encountered at the area of influence	282
Figure 87: Rhizophora mucronota down the Anse Quitor River.....	282
Figure 88: Vegetation and habitat types mapping.....	283
Figure 89: IUCN status and number of associated plant species through the study site/project area	285
Figure 90: Photographic plates with some native plant species recorded on the area of influence for terrestrial biodiversity (in red, species recorded inside the project footprint)	286
Figure 91: Endangered and threatened plant species map	287
Figure 92: Endangered and threatened plant species map (status)	288
Figure 93: Rodrigues' protected species map.....	289
Figure 94: Assessment of the native flora sensitivity inside the area of influence	292
Figure 95: Mammals on site: Pteropus rodricensis / Bos taurus / Capra hircus (©ECO-MED Océan Indien, 2019).....	302
Figure 96: Native mammal observation mapping.....	303
Figure 97: Reptiles on site: Hemidactylus frenatus / Lepidodactylus lugubris (©ECO-MED Océan Indien, 2019).....	304
Figure 98: Native reptile observation mapping	305
Figure 99: Bird strike statistics in the past 3 years	306
Figure 100: Birds on site: Butorides striata / Numenius phaeopus / Estrilda astrild (©ECO-MED Océan Indien, 2019).....	307
Figure 101: Native bird observations mapping.....	308
Figure 102: Molluscs on site: Tropicophora articulata / T. eugeniae / Subulina octona / Melanoides tuberculata (©ECO-MED Océan Indien, 2019)	309
Figure 103: Crustacean on site: Isopoda sp. (©ECO-MED Océan Indien, 2019).....	309
Figure 104: Insects on site: Junonia rhadama/Ischnura senegalensis/Gryllodes sigillatus (©ECO-MED Océan Indien, 2019)	310
Figure 105: Fresh water point on site	312
Figure 106: Arachnids on site: Nephila inaurata/Salticidae sp./Smeringopus pallidus/Isometrus maculatus (©ECO-MED Océan Indien, 2019).....	313
Figure 107: Myriapods on site: Orthomorpha coarctata/Pachybolidae sp. (©ECO-MED Océan Indien, 2019).....	313
Figure 108: Numenius phaeopus uses the coastal and open grazing lands corridor for feeding	317

Figure 109: Ecological network mapping	319
Figure 110: Marine reserves in Rodrigues (Pasnin et al., 2016).....	325
Figure 111: Perimeter of South East Marine Protected Area (Robert, 2014)	326
Figure 112: Area of influence for Marine biodiversity	328
Figure 113: Marine habitat types mapping	330
Figure 114: Photophilic algae, station n° 06 (on the left) and station n°14 (on the right).....	331
Figure 115: Gymnothorax griseus, station n° 12	332
Figure 116: Station n°33 and isolated coral	332
Figure 117: Station n°29 and small isolated coral (Turbinaria sp.)	333
Figure 118: Sandy facies of station n°28 and at the interface with brown algae beds	333
Figure 119: Burrows and tumuli at the stations n°41 (on the left) and n°32 (on the right)	334
Figure 120: Station n° 19 (on the left) and station n°37 (on the right).....	334
Figure 121: Burrow, holothuriae and spot of Caulerpa brachypus at station n°22.....	334
Figure 122: Sediment sample at station n°39	335
Figure 123: Meadows of Caulerpa brachypus, station n° 09 (on the left) and station n°17 (on the right)	335
Figure 124: Linckia sp (on the left), station n°06 and Synapta maculata (on the right), station n° 33	336
Figure 125: Hippocampus sp (on the left), station n° 45 and Oxynoe viridis (on the right), station n°16	337
Figure 126: Halophila ovalis, station n° 08 (on the left) and station n°31 (on the right).....	337
Figure 127: Coral reef, station n° 18-0	338
Figure 128: Coral reef, station n° 18-1	339
Figure 129: Coral reef, station n° 18-3	339
Figure 130: Location of potential egg-laying areas for marine turtles	342
Figure 131: Stenella longirostris and Megaptera novaeangliae (http://www.mmcs-ngo.org/en/marine-environment/cetaceans.aspx).....	344
Figure 132: Transport network of Rodrigues.....	348
Figure 133: Area of influence of the Rodrigues Airport Extension Project.....	353
Figure 134: Landscape of the project's direct control area	354
Figure 135: Bangélique breeding area	354
Figure 136: Household survey conducted in Sainte Marie Village	357
Figure 137: 2 Operational diagram of the ONA system	357
Figure 138: Individual interview about the history of the families of Sainte Marie village	358
Figure 139: Individual interview with a fisherman in Sainte Marie village	360
Figure 140: Rodrigues Island and project zone location	361
Figure 141: Rodrigues Regional Assembly (RRA) organizational chart	362
Figure 142: Rodrigues Council of Social Services (RCSS) organizational chart	364
Figure 143: Age pyramid of Sainte-Marie.....	367
Figure 144: Dwellings in Plaine Corail village	369
Figure 145: Age Pyramid of Plaine Corail	370
Figure 146: Access to basic public services (health, education) in the project area.....	374
Figure 147: Back from fishing in Bangélique.....	379
Figure 148: Fishermen's dormitory and canteen.....	379
Figure 149: Fish weighing	381
Figure 150: Anchorage used by individual fishermen in Sainte Marie	384
Figure 151: Herds gathering in Sainte Marie village at sunset.....	387
Figure 152: Goat breeding in an old fishing station.....	388
Figure 153: Proportion of animals raised among households in Sainte Marie and Plaine Corail villages	392
Figure 154: Share of livestock types by locality	392

Figure 155: Distribution of annual crops by locality.....	393
Figure 156: Distribution of fruit production by locality	393
Figure 157 Income per inhabitant / Income per household.....	394
Figure 158: Distribution of household incomes in Plaine Corail and Sainte Marie villages by type of activity.....	394
Figure 159: Building location map and area of influence	398
Figure 160 Air quality measurements location	403
Figure 161: LTO cycle (Source: Acnusa)	413
Figure 162: Diagram of sound levels.....	415
Figure 163: Illustration of the definition of the LAeq.....	416
Figure 164: Example of noise contours – French aerodrome Aix Les Milles.....	417
Figure 165 Noise measurements - location and results.....	421
Figure 166: Airport noise contours	428
Figure 167: Locally, the only built visual reference points are the airport buildings.....	434
Figure 168: The large plain backed with forested mountains and hills in the mid distance	435
Figure 169: The plain area is marked by open landscapes of large grassland.....	436
Figure 170: Grazing is the most common form of anthropogenic pressure on landscape and environment	437
Figure 171: Localization of the potential sediment discharges to the lagoon during works phase and current-meter	462
Figure 172: Earthworks areas in the restricted area of influence at Plaine Corail	468
Figure 173: Earthworks areas and associated geological formations in the restricted area of influence at Plaine Corail	469
Figure 174: Pteropus rodricensis flying over the Anse Quitor nature reserve near the project	478
Figure 175: rocky coast in the west backfilled area	528
Figure 176: Fruit of Foetidia rodriguesiana	559
Figure 177: Isolated Lygodactylus lugubris on a Latania vershaffeltii near the airport	590
Figure 178: Isolated coral colonies with <i>Acropora formosa</i> at station n°12 (on the left) and <i>Porites</i> sp. at station n°13 (on the right)	592
Figure 179: Impact lands and buildings.....	602
Figure 180: Proposed habitations relocation zone	603
Figure 181: Evolution of the catchment areas after development.....	622
Figure 182: Airport contours - operational phase	663
Figure 183: Map of “on sea” option with embankment or stilts (GIBB, 2016)	681
Figure 184: Options for avoiding construction on the sea.....	684
Figure 185: Options for avoiding Sainte Marie Hill.....	685
Figure 186: Option C chosen as base to establish the Preliminary Design	687
Figure 187: Preliminary Design Project.....	690
Figure 188 Localization of the potential sediment discharges to the lagoon during works phase and current-meter	711
Figure 189: Location of the analysis point: -63°12'E,20°S (WGS84).....	818
Figure 190: Complaint and grievance management steps.....	846

0 Glossary

AFD Agence Française de Développement
AGL Airfield Ground Lighting
AOI Area of Influence
AQNR Anse Quitor Natural Reserve
ARL Airport of Rodrigues Ltd
AML Airports of Mauritius Co Ltd
ASDA Accelerate-Stop Distance Available
ATC Air Traffic Control
CIA Cumulative Impact Assessment
CCR Constant Current Regulators
CCTV Close Circuit TeleVision
DVOR Doppler VHF Omnidirectional Radio Range
DME Distance Measuring Equipment
EC European Commission
EHS Environment Health Safety
EHSG Environmental, Health and Safety Guidelines
EIA Environmental Impact Assessment
EPA Environment Protection Act
E&S Environmental & Social
ESIA Environmental and Social Impact Assessment
ESCP Environmental and Social Commitment Plan
ESF Environmental and Social Framework
ESMP Environmental and Social Management Plan
ESS Environmental and Social Standard
ESS1 Assessment and Management of Environmental and Social Risks and Impacts
EU European Union
E&S Environmental and Social
GoM Government of Mauritius
GSE Ground Service Equipment
HVAC Heating, Ventilation, and Air Conditioning
ICAO International Civil Aviation Organisation
IFC International Finance Corporation
MDGs Millennium Development Goals
LDA Landing Distance Available
LED Light Emitting Diode
LON Length of need
NDB Non-Directional Beacon
OLS Obstacle Limitation Surface
PAPI Precision Approach Path Indicator
PCA Plaine Corail Airport
PDR Preliminary Design Report
PQC Pavement Quality Concrete
RAL Runway Approach Lights
RCSS Rodrigues council of Social Services



RESA Runway End Safety Area
RESA-O Overshoot Runway End Safety Area
RESA-U Undershoot Runway End Safety Area
RFF Rescue and Fire Fighting
RFFS Rescue and Fire Fighting Services
RGL Runway Guard Lights
RRA Rodrigues Regional Assembly
RTIL Runway Threshold Identification Lights
TODA Take Off Distance Available
ToR Terms of Reference
TORA Take Off Runway Available
SCP Stakeholder Commitment Plan
SEP Stakeholder Engagement Plan
SIDPR Sustainable Integrated Development Plan for Rodrigues
VDGS Visual Docking Guidance System
VEC Valued environmental and Social component
VHF / UHF Radio frequencies
VIP Very Important Person
VSAT Very Small Aperture Terminal
WB World Bank
World Bank ESF World Bank Environmental and Social Framework
WTP Wastewater Treatment Plant

7 Preliminary environmental, social impacts and mitigation measures

7.1 Definitions and methodology

7.1.1 Project's phase considered in this study

This study is based on the preliminary design stage. During this first design phase, there is still a possibility to study several options. Therefore, the project is not confirmed, and some elements can be modified. However, all required field investigations have been carried out at this time and confirm that the project is feasible.

The next design step will be the detailed design, which consists of the final production detailed architectural and engineering drawings of the project's physical components. The detailed design also aims to ensure of the financial viability.

In order to consider all the potential consequences of the project, the impacts were studied with a broad vision. So, it is necessary to note that certain of these impacts will be avoided when the project is finalized.

For example, an impact of the project has been studied on the caves 'Grotte Fougère' and 'Grotte Petit Lac' which are in proximity of the new runway, even if the detailed design will avoid them.

7.1.2 Methodology for impact assessment and rating

In previous aspects of this study, receptors were defined and evaluated.

The chapter below aims to evaluate the consequences of the project (impacts), on all the receptors identified in the baseline.

For each theme, the impacts are defined and classified according to whether they are:

- Temporary work impacts. These impacts are intended to appear during the project implementation phase, but to disappear once the works phase is completed (e.g. noise caused by the work equipment);
- Definitive work impacts. These impacts are intended to appear during the works phase, and to continue once the work is completed (e.g. destruction of habitat located in the project footprint);
- Operational impacts. These impacts are linked to the very existence and operation of the project (e.g. noise caused by the planes landing and taking off).

Each identified impact was numbered, then the following protocol was carried out:

- For each of these three types of large impacts, an assessment of the intensity was first conducted and rated on the basis of their severity (impact severity) as : 1 - not significant, 2 - low, 3 - medium, 4 - high, 5 - major.

Table 76: Impact severity

Impact severity	Not significant	Low	Medium	High	Major
-----------------	-----------------	-----	--------	------	-------

The severity impacts were confronted with the sensitivity of the issues they affect. The evaluation of impact severity and receptors sensitivity is done regarding the previously described social impact assessment process and according to the various consultations and meetings with stakeholders during the field study. This provides the level of impact (impact magnitude). The severity of the social impacts and sensitivity of the receptors are then combined through a matrix to obtain the magnitude of the impact. This matrix applies both to adverse and positive impacts. The specific criteria used to assess the magnitude of each type of social impact are those defined in the assessment of impacts. The table below illustrates the magnitude matrix of social impacts:

Table 77: Magnitude matrix of social impacts

Impact severity	Not significant	Low	Medium	High	Major
Receptor sensitivity					
Low	Negligible	Low	Low	Low	Medium
Medium	Negligible	Low	Low	Medium	High
High	Negligible	Low	Medium	High	Major
Major	Low	Medium	High	Major	Major

- Following the identification and assessment of impacts, avoidance, reduction and impact compensation measures have been defined and numbered. The same measure can correspond to avoiding or mitigating several impacts.
- Finally, to correct previously identified impacts, these measures made it possible to carry out a new assessment of the impacts intensity. This is the mitigated impact or residual impact.

7.1.3 Methodological specificities for certain themes

7.1.3.1 Social impacts assessment

7.1.3.1.1 Identification of the social impacts and principal categories of impacts

Before considering the assessment of social impacts, it is necessary to clearly identify them. To do this, it is necessary to determine the sources of these impacts, which amounts to distinguishing all the factors that could have an effect, positive or adverse, on the socio-economic environment.

These sources of impact are therefore linked to the work and activities needed and established during works and operational phases of the project.

The identification of impacts continues through their categorisation through the socio-economic variables that characterize the communities studied.

- Impacts on local governance and social dynamics

The aim is to understand to what extent the presence of the project will contribute to the modification of the balances and social relations within the communities.

- Impacts on demography and migration

The aim is to measure the impact of the project on the demographic evolution of the villages by focusing on the number, origin and motivation of the newcomers.

- Impacts on land

The aim here is to assess the relocation impacts induced by the project in particular with regard to the loss of habitat, collective infrastructures and agricultural and grazing areas.

- Economic impacts

These are the impacts on livelihoods such as farming and livestock activities, fishing, and local economic context such as employment, trade, etc.

- Impacts on community development potential

The aim here is to measure the impacts it might have in terms of the development of communities living in the vicinity of the project area.

- Impacts on the living environment

These are the visual impacts such as changes induced in the landscape but also noises, vibrations, odours, etc.

- Public health impacts

The aim of the airport runway extension project is to measure the evolution of conditions of access to health services.

- Impacts on cultural heritage

For the Rodrigues airport runway expansion project, the main aim is to identify cultural heritage sites to be displaced or destroyed, ancestral practices that may be abandoned as a result of changes in the ways of life. Preliminary studies have also shown that there are no cultural sites or practices on the areas directly or indirectly impacted.

- Impacts on the safety of people and property

The aim is to measure the different types of risks associated with the safety of people and property such as theft, lack of road safety, and risks of intrusion on the project sites or even social tensions in relation to the project.

- Cumulative impacts

Cumulative impacts are the result of the accumulation and interaction of several direct and indirect impacts generated by the same project or by several projects over time and space and which can lead to abrupt or gradual changes in the receptor media.

7.1.3.1.2 Assessment of social impacts and mitigation measures

The assessment of social impacts is developed from a series of indicators that help to highlight the complexity of the dimensions of an impact. The impacts of the project are addressed according to their nature and importance.

The impacts can be either positive (improvement of the components of the environment) or adverse (deterioration of the components of the environment).

To measure the importance of social impacts, indicators are accompanied by variables that express the result of applying an indicator to a given situation. The importance of an impact refers to the changes caused by the project to a component.

7.1.3.1.2.1 Social Impact Assessment Process

Social impact assessment is a process of assigning indicators and their variables in order to assign a value to each impact. The evaluation of these impacts revolves around four questions:

- Predictive question:

What will happen to the communities, their living conditions and their activities as a result of the project being implemented?

- Evaluation question:

Does this impact pose a problem and how important is it?

- Mitigation question:

If the impact is important, is there a solution to avoid or reduce the negative effects or, conversely, to improve the positive effects?

- Residual impact evaluation question:

Is the impact still important following the implementation of mitigation measures?

7.1.3.1.2.2 Severity of social impacts

The impact assessment thus gives a description of what will happen to the communities while specifying and quantifying, to the extent possible, the intensity of the impacts.

- Spatial limits of the impact:

This corresponds to the scope of the project's effects on the social component under study.

- Impact duration:

This corresponds to the period during which the impacts will affect the studied component.

- Probability of the impact:

This corresponds to the actual probability that an impact can affect a component.

- Intensity of the impact:

This is determined by the intensity of the disturbances induced for the populations subject to impact. The magnitude depends on the degree of disturbance, but also on the number of people affected in relation to the total population of the area considered.

- Reversibility of the impact:

This means the possibility for an impact to be mitigated to the point that the impacted environment returns to its initial state.

7.1.3.1.2.3 Magnitude of social impact

The matrix of magnitude is used to cross the receptor sensitivity and the severity of the impact.

7.1.3.2 Landscape and visual impact assessment

7.1.3.2.1 Area of influence

For the purposes of assessment, visual and landscape impact assessment, the study area is defined as the area in which the project can be seen by the human eye. This is called the Zone of Theoretical Visibility or Zone of Visual Influence.

ZTV or ZVI analysis is the process of determining the visibility of an object in the surrounding landscape. The process is objective in which areas of visibility or non-visibility are determined by computer software using a digital elevation dataset. The output from the analysis is used to create a map of visibility.

The ZTV/ZVI illustrates the potential (or theoretical) visibility in the landscape of the Mount Saint-Mary and new runway. The phrase "potential visibility" is used to describe the result because the analysis does not take into account any landscape artefacts such as trees, woodland or buildings etc. The analysis is made on the basis of topography alone.

The results are not intended to show the actual visibility of Mount Saint-Mary or the runway, they are intended to indicate where it may be visible. Therefore, it gives an indication about the project area of influence in the existing landscape.

Actual visibility can only accurately be determined by site survey since there are a multitude of local variables that may affect lines of sight. On the other hand, the ZTV/ZVI map does show where an object definitely cannot be seen.

7.1.3.2.2 Impact prediction and evaluation

The sensitivity, magnitude and significance of impacts will depend on the nature and degree of changes in landscape resources, nature from a receptor perspective, and the population's values and attachment to the landscape.

Receptor perspective could be for example, a village where people have a permanent view of the project from home. Public places will be a more sensitive subject than a site where people only pass through while travelling and have a transitional view of the airport project.

People's reaction to change (i.e. their judgment, positive or negative, and its importance) will be influenced by their attitude towards the airport, the material or other positive impacts it brings to them (employment, economic development, mobility, etc.), its impacts in other areas (land occupation and fragmentation, noise pollution, etc.), and any perception of inequality in the distribution of costs and positive impacts.

7.1.3.2.3 Predict the magnitude of change

In a landscape or field of vision, the magnitude of change depends on a number of factors:

- The mass and scale of the new or modified elements in the view;
- The probability that the new elements will be masked by other elements such as vegetation, hills, buildings;
- The perception of the changes, i.e., how far away from the project they are, if they can see the project in the foreground, intermediate and background or if it can be perceived above or below a person's normal field of vision (factors influencing visibility and perception are highlighted in a box on the next page);
- The compatibility of the different components of the project with the character of the existing landscape, takes into account that the landscape is natural, modified or built, the characteristics of the landscape and the importance of each of them in the value of the project, to what extent the components of the project are adapted to these characteristics in terms of size, shape, colour, texture, materials;
- The ability of the foreground, intermediate and background of the landscape to integrate the change.

The ZVI and the maps of visual measures efficiency are based on the Mount Saint Mary clearance and runway construction only. No built form was modelised into GIS. Some buildings of visual importance might have further significant visual impact: the water tower, the 20m high Air Traffic Control tower and the fuel farm. They have been assumed to be considered as positive new features in the landscape for the residents.

7.1.3.2.4 Human perception and visibility

A number of assumptions were made about how the project would be perceived at various distances. First, it was assumed that the closer an observer is to the airport, the more likely these changes will be perceived as visually dominant. As the observer moves away, changes perceived as visually dominant become visible, becoming clearly visible, then visible, then discernible and eventually becoming indistinguishable:

- Potentially visually dominant (magnitude of change: High) - up to 500 m from project scope;
- Clearly visible (magnitude of change: Average) - between 500 m and 7 km;
- Visible (magnitude of change: Low) - between 7 and 14 km; however, the perception will start to depend mainly on the horizontal width of the project and its location in the landscape;
- Discernible to indistinguishable (magnitude of change: Negligible) - between 14 and 30 km.

7.1.3.2.5 Mapping measures to reduce visibility

Planting represents the main quantifiable measure in terms of efficiency. The planting has been modelised into GIS and the resulting ZVI has been challenged. The planting location and extent has been modified to ensure minimum residual impact persists. Despite exact location and extent of planting, this iterative work required changes in vegetation height to reach a low mitigated impact. Vegetation height has been considered to range from 5m high (shrub vegetation), to 10m (tall shrub and small trees), to 20m (forest trees) to 30m high (tall trees).

Uninhabited locations have been withdrawn of the ZVI (eg. Forested hillside). Visual mitigations have been assessed for inhabited area only.

7.2 Temporary Impacts during Construction

7.2.1 Physical environment

7.2.1.1 Marine physical environment: shores, currents, turbidity and sedimentation

As approximately 2.7 ha of the new runway is built at sea, it is anticipated that seafloor will be disturbed as a sediment plume will be pumped from the backfilled area into the sea. It will increase turbidity and sedimentation while degrading the seawater quality. The potential dredging related to the construction of the boathouse will also generate a high level of turbidity.

Hence, the main potential temporary impacts on the marine physical environment are:

- Increase in turbidity;
- Modification of the seabed;
- Dredging at the boathouse.

7.2.1.1.1 Impact Phy-Mar-W-Temp-1: Increase in turbidity

7.2.1.1.1.1 Impact before mitigation

First of all, it is assumed that all equipment available for marine construction is land-based, no contamination from maritime equipment is considered.

Primary construction materials are dug out from the hill in the vicinity and used to backfill an enclosing structure, the newly reclaimed land from the sea founding the runway.

Filling the enclosing structure with sediment implies evacuating water once decantation is achieved. It is not recommended to reject it by overflow as there is no control of the process whatsoever. Doing so, important loads of fine particles can be released and impact receptors at significant distances from the work area. Local and temporal resuspension of those sediments can cause temporary increases in suspended particles concentration and turbidity that can lead to lethal stress for coral. It is recommended to pump water from the fenced area and discharge into the ocean in order to be able to regulate the flow rate and concentration of fine particles.

The extent, intensity and persistence of construction generated sediment plumes are determined by hydrodynamic and quality numerical models under main hydrodynamic condition with D-Water Quality module of Delft3D suite.

This module simulates the far- and mid-field water and sediment quality due to a variety of transport and water quality processes. To accommodate these, it includes several advection diffusion solvers and an extensive library of standardised process formulations with the user-selected substances. Default processes allow to simulate the deposition and resuspension of particles to and from the bed. The model used for the dispersion of sediment plume use the same grid as the current model and reuse the hydrodynamics results as input for the dispersion, deposal and resuspension of sediments.

The following hypotheses are taken into account:

- 5 discharges located in the vicinity of the reclaimed to the sea newly build area and near the boathouse (see location in Figure 171);
- A specific flow of 0.1 m³/s for a 2000g/m³ concentration;
- 14.5 days simulations to include one neap tide and one spring tide cycle;

- Non-concomitance of the discharge with a 3 days delay;
- Two wind conditions: 8.5 m/s mean wind and 5.5 m/s light wind;
-
- Process parameters:

Table 78: Marine water quality model - Process parameters

- Sedimentation velocity	- Critical shear stress for sediment	- Porosity of sediment layer	- Zeroth-order resuspension flux	- Critical shear stress for resuspension
- 0.0002 m/s	- 0.1 N/m ²	- 0.35[-]	- 0.0001 kg/m ² /s	- 0.2 N/m ²

Main results such as exceedance time and maximum level are presented below.

An overall analysis of the temporal and special variability of the sediment plume highlights 4 main characteristics:

- The plume spreads in the same direction as the current (North-East);
- The level of inorganic matter is the highest at the West side of the new runway where the current is lower and so the dispersion is weaker;
- The inner and shallow part of Topaze Bay is not impacted which it consistent with the local circulation, almost non-existent in this area;
- Spatial variations in the lagoon are much greater with lighter wind. The plume reaches North Bay with light wind but barely passes Pointe Mapou when mean wind blows, respectfully at 9.9km and 4.4km of the boathouse. With lighter wind, the plume tends to go farther west, up to 2 km west from Fregate Island.
- The main receptor affected by this action may be the seawater quality.

The **impact severity is major**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is major**.

Table 79: Results from the marine water quality model

	MEAN WIND	LIGHT WIND
<p>Exceedance Time over 2 NTU of Inorganic Matter</p> <p>Exceedance time</p> <ul style="list-style-type: none"> <2% 2-5% 5-10% 10-20% 20-30% 30-40% 40-50% 50-60% 60-70% >70% 	<p>New Runway of Plaine Corail Airport CURRENT STATE - EXCEEDANCE TIME OVER 2 NTU OF INORGANIC MATTER HYDRODYNAMIC MEAN ANNUAL CONDITION - DISCHARGES 20&L & 0.1 MFS - MEAN WIND</p>	<p>New Runway of Plaine Corail Airport CURRENT STATE - EXCEEDANCE TIME OVER 2 NTU OF INORGANIC MATTER HYDRODYNAMIC MEAN ANNUAL CONDITION - DISCHARGES 20&L & 0.1 MFS - LIGHT WIND</p>
<p>Exceedance Time over 10 NTU of Inorganic Matter</p> <p>Exceedance time</p> <ul style="list-style-type: none"> <2% 2-5% 5-10% 10-20% 20-30% 30-40% 40-50% 50-60% 60-70% >70% 	<p>New Runway of Plaine Corail Airport CURRENT STATE - EXCEEDANCE TIME OVER 10 NTU OF INORGANIC MATTER HYDRODYNAMIC MEAN ANNUAL CONDITION - DISCHARGES 20&L & 0.1 MFS - MEAN WIND</p>	<p>New Runway of Plaine Corail Airport CURRENT STATE - EXCEEDANCE TIME OVER 10 NTU OF INORGANIC MATTER HYDRODYNAMIC MEAN ANNUAL CONDITION - DISCHARGES 20&L & 0.1 MFS - LIGHT WIND</p>
<p>Exceedance Time over 50 NTU of Inorganic Matter</p> <p>Exceedance time</p> <ul style="list-style-type: none"> <2% 2-5% 5-10% 10-20% 20-30% 30-40% 40-50% 50-60% 60-70% >70% 	<p>New Runway of Plaine Corail Airport CURRENT STATE - EXCEEDANCE TIME OVER 50 NTU OF INORGANIC MATTER HYDRODYNAMIC MEAN ANNUAL CONDITION - DISCHARGES 20&L & 0.1 MFS - MEAN WIND</p>	<p>New Runway of Plaine Corail Airport CURRENT STATE - EXCEEDANCE TIME OVER 50 NTU OF INORGANIC MATTER HYDRODYNAMIC MEAN ANNUAL CONDITION - DISCHARGES 20&L & 0.1 MFS - LIGHT WIND</p>
<p>Maximum Level of Inorganic Matter</p> <ul style="list-style-type: none"> <0.1 0.1 - 0.5 mg/l 0.5 - 1 mg/l 1 - 1.5 mg/l 1.5 - 2 mg/l 2 - 4 mg/l 4 - 6 mg/l 6 - 8 mg/l 8 - 10 mg/l 10 - 20 mg/l 20 - 40 mg/l 40 - 60 mg/l 60 - 80 mg/l 80 - 100 mg/l 100 - 500 mg/l >500 mg/l 	<p>New Runway of Plaine Corail Airport HIGHEST LEVEL OF INORGANIC MATTER HYDRODYNAMIC MEAN ANNUAL CONDITION - DISCHARGES 20&L & 0.1 MFS - MEAN WIND</p>	<p>New Runway of Plaine Corail Airport HIGHEST LEVEL OF INORGANIC MATTER HYDRODYNAMIC MEAN ANNUAL CONDITION - DISCHARGES 20&L & 0.1 MFS - LIGHT WIND</p>

7.2.1.1.1.2 Mitigation measure and impact after mitigation

Phy-Mar-Mit-1

The construction processes must ensure a minimal volume of water in the low-lying embankment delimited area to insure the stability and sustainability of the runway. The connection between the seabed and the rocks is as watertight as possible to ensure the minimal infiltration volume. Extra water is carefully drained off to avoid the potential fine-sediment wash-out due to water pressure.

Phy-Mar-Mit-2

The discharge should be located in order to promote a local settling of the inorganic matter, i.e. away from the strongest current, and release a controlled level of fine particles.

A specific hydrodynamic survey should be conducted to optimize the position of each discharges in the vicinity of the build onto the sea part of the new runway using a representative local climate (wave, wind and water level). Several localizations for each discharge could be tested in order to choose which configuration minimizes the plume extent and/or does not reach sensitive areas such as corals.

The selected solution will have to be modelled over the entire discharge period to ensure that there is no impact by taking realistic conditions (representative local climate (wave, wind and water level) and tidal conditions).



Figure 171: Localization of the potential sediment discharges to the lagoon during works phase and current-meter

In order to determinate shutdown and warning thresholds, median value of turbidity in Topaze bay would need to be evaluated in a normal state, constituting an initial and reference state for the future turbidity in-situ measure to be compared to. At least three current meters and

turbidimeters are installed to insure the construction follow-up (see map below) in the vicinity of the runway:

- In the channel between Crab Island and the mainland;
- South of Plaine Corail to monitor the entrance of Anse Quitor;
- Near the corals in the entrance of Topaze Bay.

Phy- Mar-Av-3

The extent of the plume is mitigated by selecting an adequate timetable. Discharges better not occurs during significate reverse of flows.

A specific hydrodynamic survey could be conducted to test the best time to release inorganic matter in the sea. The time of year, the tidal cycle and spring tide or neap tide period should be considered to determine the start of discharge. The duration of discharge and the time it occurs regarding the velocity and direction of current also affects the turbid flume extent and position.

The current and magnitude of current could be monitored by a current-meter in the channel between Crab Island and Plaine Corail where they are at their maximums. Construction would stop if the reversal lasted more than 3 hours and velocity higher than 0.2m/s.

Phy- Mar-Mit-4

Silt curtains can be used to contain suspended sediments during the working operation. This technique has been successfully used to prevent sediment dispersal in numerous projects from dredging to construction projects. It would be used around the 5 discharge points and in case of dredging in front of the jetty boathouse.

A silt curtain is a permeable or impervious structure that sits suspended in the water column to control migrating water borne sediment and silt. It contains sediment about one to two meters from the water surface where the turbidity is the most active. Silt curtains allow suspended sediment to settle and drop to the bottom within the water column by controlling dispersion. Water depth, quantity and type of material in suspension, hydrodynamic conditions and project duration have to be considered when designing and installing silt curtain. The curtain should remain clear from the sea bed at low tide, it should be free moving and not anchored under sand or dispersed mud.

The construction layout and the area expected to be potentially impacted are identified and surveyed after which the required length of the silt curtain is decided. Once the desired length of silt curtain is connected, anchors are fixed on the land and the furled curtains can be towed to site at a maximum two to three knot speed.

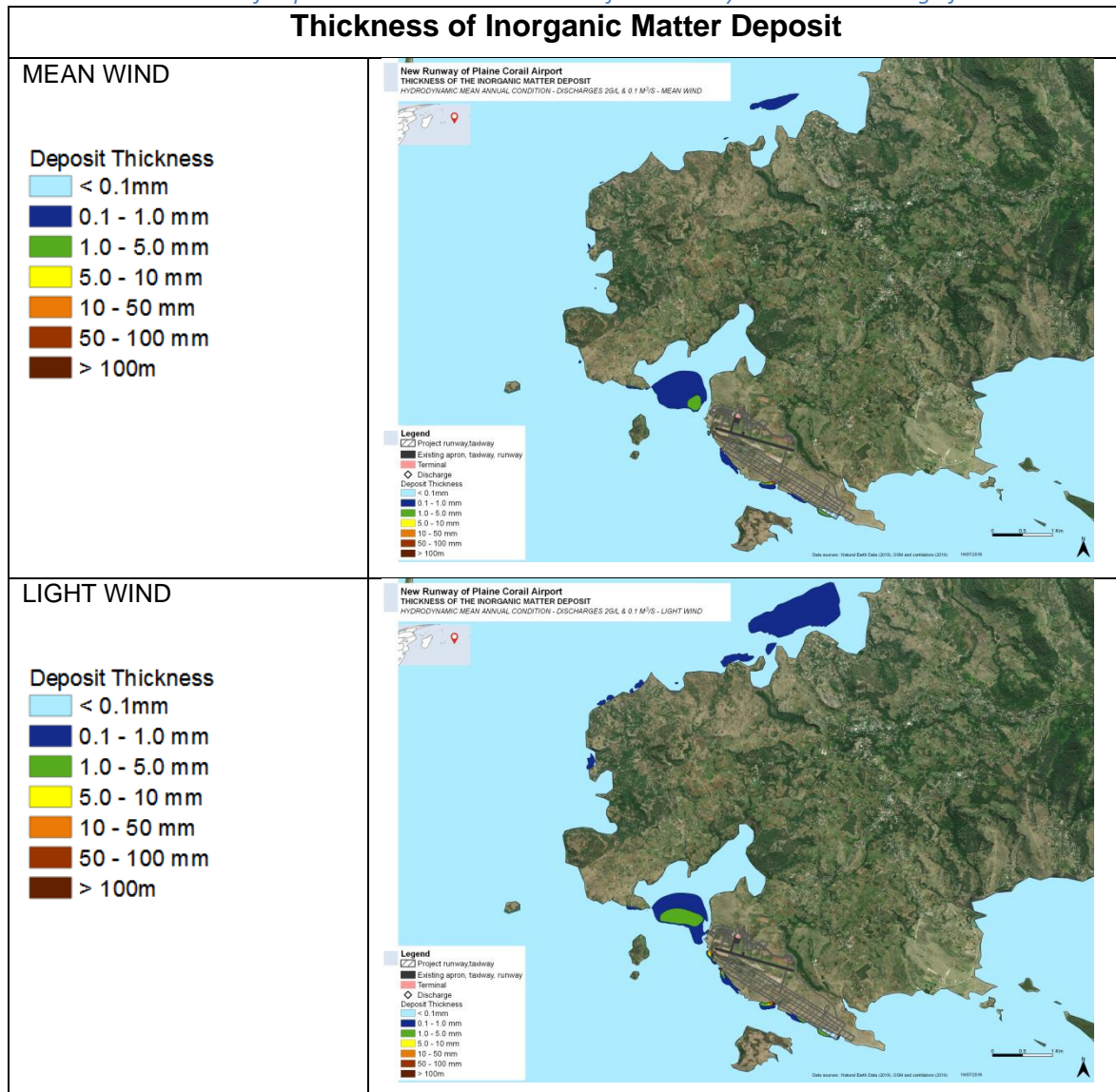
The proposed measures result in a **high severity mitigated impact** thus **The residual impact is of high magnitude.**

7.2.1.1.2 Impact Phy-Mar-W-Temp-2: Modification of the seabed

7.2.1.1.2.1 Impact before mitigation

The turbid plume also affects the seabed. Change in its composition might be detectable after the fine-sediment has settled down. Sediment thickness due to the suspended loaded water discharge is reported in the table below.

Table 80: Thickness of deposit due to the construction of the runway in the surrounding of Plaine Corail



Areas around the discharge location are the most impacted. The thickness of inorganic matter related to the construction can locally be larger than 10 cm. The extent is limited at the entrance of North Bay 9 km away from the first release point. Though the thickness is less than 1 mm.

Sediment deposits in the entrance of Bay Topaze reach a maximum of 5mm.

The main receptor affected by this action may be the marine sediment quality.

The impact severity is medium. Considering the receptor sensitivity assessed as medium, the impact magnitude is low.

7.2.1.1.2.2 Mitigation measure and impact after mitigation

The preceding mitigation measures can also be applied to limit the dispersion of the turbid plume and its effects on the marine sediment content.

The proposed measures result in low severity mitigated impact. The residual impact is of low magnitude

7.2.1.1.3 Impact Phy-Mar-W-Temp-3: Dredging in front of the boathouse

7.2.1.1.3.1 Impact before mitigation

Dredging may be carried out to deepen the access to the future jetty facilities and boathouse, in the North of the Airport, in order to allow larger ship access. This work is done by mechanical dredgers, this technic generates fine materials suspension that could increase the local turbidity and modify the sea-bed.

The main receptor affected by this action may be the seawater quality.

The **impact severity is major**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is major**.

7.2.1.1.3.2 Mitigation measure and impact after mitigation

The preceding mitigation measures can also be applied to limit the dispersion of the turbid plume and its effects on the marine sediment content. The relevant turbidimeter is the one located next to the corals.

Silt curtain is especially needed to control the suspended solids generated by the dredging. It will be placed around the excavation site.

The proposed measures result in a **high severity mitigated impact**. Thus **The residual impact is of high magnitude**.

7.2.1.1.4 Summary

Table 81: Temporary Impact during Construction - Physical Environment

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Phy-Mar-W-Temp-1	Increase in turbidity	Adverse	Major	Phy-Mar-Mit-1	Mitigation - Controlled backfilled processes	High
				Phy-Mar-Mit-2	Mitigation - Optimisation of the location of discharges	
				Phy-Mar-Av-3	Avoidance - Optimisation of the discharges timetable to avoid times when currents reverse and/or already turbid condition	
				Phy-Mar-Mit-4	Mitigation - Silt curtain around discharges	
Phy-Mar-W-Temp-2	Modification of the seabed	Adverse	Low	Phy-Mar-Mit-1	Mitigation - Controlled backfilled processes	Low
				Phy-Mar-Mit-2	Mitigation - Optimisation of the location of discharges	
				Phy-Mar-Av-3	Avoidance - Optimisation of the discharges timetable to avoid times when currents reverse and/or already turbid condition	
				Phy-Mar-Mit-4	Mitigation - Silt curtain around discharges	
Phy-Mar-W-Temp-3	Dredging in front of the boathouse	Adverse	Major	Phy-Mar-Av-3	Avoidance - Optimisation of the discharges timetable to avoid times when currents reverse and/or already turbid condition	High
				Phy-Mar-Mit-5	Mitigation - Silt curtain around dredging area	

7.2.1.2 Hydrology

No temporary impact.

7.2.1.3 Geotechnics and Hydrogeology of the karstic system

7.2.1.3.1 Earthworks in the new proposed runway area

The new runway project geometry of the Rodrigues airport, corresponding to option C, as proposed by GIBB (Mauritius) LTD in the Preliminary Design stage, allows to define earthworks cutting and embankment areas depending on the project elevation of the new runway, with respect to ground level.

The Figure 172 highlights the embankment and cutting areas. The total volume of extracted materials from the cutting area (zone 2) is about 3,481,835 m³ whereas the total volume of imported materials for the embankment areas (zones 1 and 3) is 2,099,022 m³ (GIBBS, 2018).

The mass haul is thus unbalanced. Cut material are expected to be re-used as filling material. To allow this reuse of materials, the extracted cuttings should comply with the British Standards *BS EN 16907-1:2018 Earthworks. Principles and general rules*:

- BS 6031-2009 Code of practice for Earthworks (Table7);
- SHW 600 Series earthworks (§ 608, Class 6A soils in Table 6/1 and 6/2).

If all the cut material could be reused, an important volume of cut material would remain left over.

The Figure 173 also highlights that embankment and cutting areas correspond to different geological formations:

- The embankment areas (zones 1 and 3) are almost entirely located on Eolian Calcarenite Formation,
- The cutting area (zone 2) is mainly located on Eolian Calcarenite Formation, but the southern part of the cutting area is set on an existing basalt outcrop.

Extraction techniques will depend on the stiffness of the basalt and calcarenite materials:

- Basalts Formation - it is proposed to prefracture basalts rocks with open phase blasting (sequential blasts with fixed unit explosive charges - need to perform blasts tests before), then to excavate the basalt blasted debris with dedicated excavators.
- Calcarenites Formation - softer calcarenite materials could be extracted with excavators (after ripper prefracturing if any). If hard strata is encountered during excavation, then open phase blasting will be locally used.

It has to be noticed that blast vibrations could be adjusted to deal with the impact of the closest caverns to the project area: Grotte Fougère, Petit Lac, Cabris, Bouteille and Gastonia. In this sensitive area where caverns stability needs to be ensured, blast vibrations caused by explosive techniques could be reduced by using smaller unit charges, close to these caverns.



Figure 172: Earthworks areas in the restricted area of influence at Plaine Corail

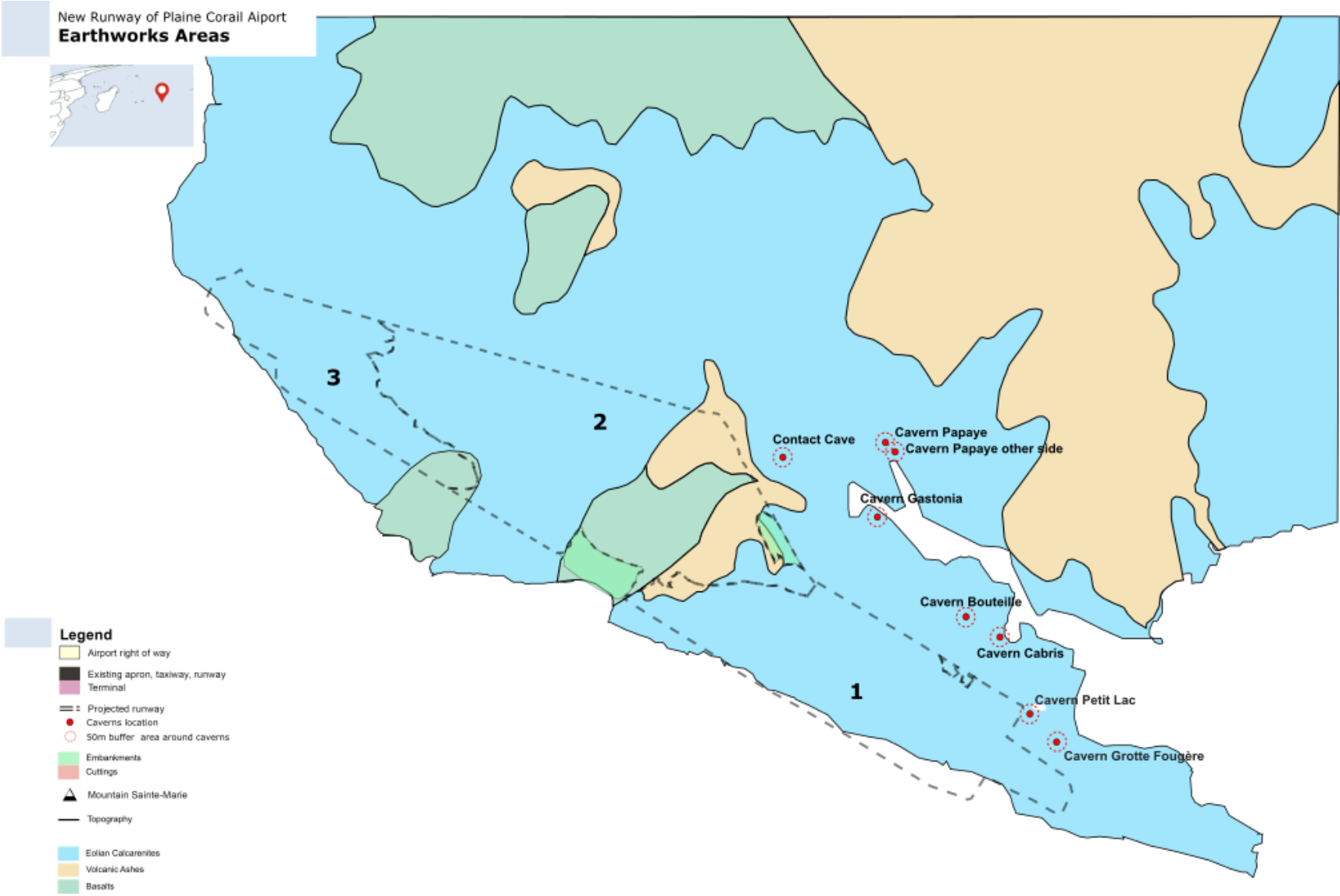


Figure 173: Earthworks areas and associated geological formations in the restricted area of influence at Plaine Corail

7.2.1.3.2 Phy-Kar-W-Temp-1: Vibrations

7.2.1.3.2.1 Impact before mitigation

Heavy earthmoving machinery will generate vibrations.

The impact severity is high. Considering the receptor sensitivity assessed as high, the impact magnitude is high.

7.2.1.3.2.2 Mitigation measure and impact after mitigation

Reduce speed of trucks' movement to an acceptable level in order to minimize the induced vibrations. Reduce rotations between embankment site and material storage site.

In addition, baseline observations should be carried out and document at potentially exposed buildings to check on the presence of cracks ahead of works.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of negligible magnitude.

7.2.1.3.3 Phy-Kar-W-Temp-2: Mass haul - Hauling equipment movement inducing vibration and noise pollutions

7.2.1.3.3.1 Impact before mitigation

Construction works for the new runway and the associated taxiways and buildings will involve a very significant movement of materials to excavate and fill (see volume of materials in cutting and embankments areas, refer to section 5.6.1 Earthworks and construction above voids). The site level will be changed.

A mass haul movement is the movement of excavated material from where it arises to where it is to be used, treated or disposed of. It impacts local topography drastically and will affect the in situ soils mechanical characteristics (calcarene and basalt geological formations).

The impact severity is major. Considering the receptor sensitivity assessed as high, the impact magnitude is major.

7.2.1.3.3.2 Mitigation measure and impact after mitigation

In order to reduce the quantities of imported materials, the materials extracted from the cutting area in the centre of the project may be reused in embankment areas.

Extracted topsoil materials from the cutting area may be reused inside the project footprint but outside the runway's clear graded strip area.

Material reuse needs to be checked with new ground investigations and laboratory tests in order to appreciate the quality of reuse of all potential extracted materials, taking into account, for example, sulphate contents or moisture contents, this to guaranty that these materials are suitable for reuse in embankments.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of low magnitude.

7.2.1.3.4 Phy-Kar-W-Temp-3: Erosion/Groundwater ingress

7.2.1.3.4.1 Impact before mitigation

Mass haul movements coupled with rainwater will induce local erosion because of existing topography changes and in situ geological formations fracturation. Local and/or large erosion at ground surface may occur during works phase and induce the collapse of features inside and outside the footprint area of the runway project. In addition, groundwater ingress can occur during excavation and may impact the stability of the cutting and embankment areas of the project.

The impact severity is high. Considering the receptor sensitivity assessed as high, the impact magnitude is high.

7.2.1.3.4.2 Mitigation measure and impact after mitigation

Local erosion features may be mitigated case by case by infilling of low quantities of granular material to stabilise the local topography. Rainwaters will be diverted towards infiltration ponds using drainage accordingly along and inside the entire footprint area of the project.

In addition, open blasting and site excavation works phase may be done during dry season to reduce erosion features at ground surface inside and outside the footprint area too.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of low magnitude.

7.2.1.3.5 Phy-Kar-W-Temp-4: Noise Blasting

7.2.1.3.5.1 Impact before mitigation

Excavation techniques used during works phase will induce noise, especially noise coming from the open blasting excavation phase, which is needed to excavate basalts and very stiff calcarenites. Other noise impacts are generated by the excavator's activity during work.

The impact severity is high. Considering the receptor sensitivity assessed as medium, the impact magnitude is high.

7.2.1.3.5.2 Mitigation measure and impact after mitigation

In order to reduce the noise impact generated by blasting and excavator's activity, the following mitigations may be used:

- adapt unit explosive charge to generate the lowest noise impact,
- schedule open blasting phases as short as possible in operation time,
- work during the day (fixed hours within the day), avoid work during the night, and inform local authorities and communities about the health and safety plan applicable on work site
- avoid running excavator's engines if they are not being used.

The proposed measures result in a medium severity mitigated impact. Thus, The residual impact is of medium magnitude.

7.2.1.3.6 Phy-Kar-W-Temp-5: Cut and fill balance impacts

The cut and fill balance should lead, if all the cuttings can be reused as expected, to a excess of materials. However, it can't be certain yet that the cuttings will be able to be reused and there might need to import material for filling.

This section addresses the impact of material import and cuttings management. However as it is not known yet how much could be reused, impacts nor measures aren't quantified.

7.2.1.3.6.1 Impact before mitigation

In both cases of infill material import and cuttings export, the transport impact might be high, depending on quantities of material:

- in terms of carbon footprint, especially in case of cargo import;
- noise and air pollution due to trucks traffic bringing materials to or from the works area.

The impact severity could be medium to major. Considering the receptor sensitivity assessed as high, the impact magnitude is medium the impact magnitude is high to major.

7.2.1.3.6.2 Mitigation measure and impact after mitigation

In case of import material need, the closest extraction site would have to be chosen, taking into account the impacts on the extraction site environment. An impact assessment would have to be presented by the contractor and the extraction site will have to be approved by the client.

In case of cuttings to manage, it will be forbidden to export the material out of the airport area. All treatment and reuse possibilities will have to be explored: in backfill is not possible, use in the concrete fabrication process will have to be studied. If no reuse were possible, storage in landscaping hills would have to be done.

The proposed measures could result in a not significant to high severity severity mitigated impact. Thus, the mitigated impact could be of negligible magnitude to high magnitude.

7.2.1.3.7 Summary

Table 82: Temporary Impact during Construction – Physical Environment Karstic System

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Phy-Kar-W-Temp-1	Vibrations	Adverse	High	Phy-Kar-Mit-1	Mitigation - Reduce speed of trucks' movement to an acceptable level	Negligible
				Phy-Kar-Mit-2	Mitigation - Reduce rotations between embankment site and material storage site Carry out and document baseline observations at potentially exposed buildings to check on the presence of cracks ahead of works.	
Phy-Kar-W-Temp-2	Mass haul - Hauling equipment movement inducing vibration and noise pollutions	Adverse	Major	Phy-Kar-Mit-3	Mitigation - Reuse of materials from cutting to embankment areas	Low
				Phy-Kar-Mit-4	Mitigation - Reuse of topsoil materials after works phase	
Phy-Kar-W-Temp-3	Erosion/Groundwater ingress	Adverse	High	Phy-Kar-Mit-5	Mitigation - Infilling of local erosion features and use of drainage system to manage rainwater responsible for local erosion	Low
				Phy-Kar-Mit-6	Mitigation - Open blasting and site excavation works to be done during dry season	
Phy-Kar-W-Temp-4	Noise blasting	Adverse	High	Phy-Kar-Mit-7	Mitigation - Reduce unit explosive charge decreasing noise impact	Medium
				Phy-Kar-Mit-8	Mitigation - Concentrate open blasting operations in a short amount of time	
				Phy-Kar-Mit-9	Mitigation - Work only during the day and inform local authorities and communities about the health and safety plan applicable on work site	
				Phy-Kar-Mit-10	Mitigation - Avoid running excavator's engines in case of no use	
Phy-Kar-W-Temp-5	Cut and fill balance impacts (transport impacts)	Adverse	Medium to major	Phy-Kar-Mit-11	Mitigation – Chose the closest extraction site for fill material / Forbid the export of cuttings	Negligible to high

7.2.1.4 Water resource and waste water management

7.2.1.4.1 Impact Phy-Wat-W-Temp-1: impact of water resource due to work water supply

7.2.1.4.1.1 Impact before mitigation

The supply of water (drinking and non-drinking water, intended for watering the tracks, for supplying processes such as concrete manufacturing, washing machinery, etc.) is likely to weigh on the already very tight public water supply network.

The **impact severity is high**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is major**.

7.2.1.4.1.2 Mitigation measure and impact after mitigation

It is proposed to install a temporary desalination plant for the works supply, producing water for the works needs including drinking water for the workers. This temporary plant should pump water from the sea and provide fresh water and drinking water. (Phy-Wat-Mit-1)

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of **negligible magnitude**

7.2.1.4.2 Impact Phy-Wat-W-Temp-2: impact of works on water resource due to impact on karstic groundwater

7.2.1.4.2.1 Impact before mitigation

The vibrations associated with the stripping of natural surface materials can increase the transport of fine particles in groundwater. The karst network of aquifers contributes to the transport of these particles without filtering them. The groundwater component that feeds the Caverne Bouteille intake could then have an increase in turbidity. This change in turbidity could affect the pumping system. Most of all, it would then influence the reverse osmosis treatment process (saturation of the micro-membranes) so the Caverne Bouteille desalination plant could be affected to.

The **impact severity is major**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is major**.

7.2.1.4.2.2 Mitigation measure and impact after mitigation

To mitigate this impact, the temporary or permanent relocation of the water abstraction at Caverne Bouteille has to be planned. A feasibility study for an alternative source out of the area of influence must be completed before work begins. As it is likely that another intake in the groundwater will be difficult to find, it is proposed to replace Caverne Bouteille intake by a see water pumping. The Caverne Bouteille desalination plant should be upgraded in order to enable it to treat seawater and provide drinking water. The current capacity of 1000 m³/day must be maintained.

(Phy-Wat-Comp-2)

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of **negligible magnitude**

7.2.1.4.3 Impact Phy-Wat-W-Temp-3: impact of works waste water

7.2.1.4.3.1 Impact before mitigation

The construction activities and processes and the workers living on the site during the works will generate waste water which, if discharged into the natural environment without treatment, would cause unacceptable pollution. However the existing water treatment system is not large enough to take this into account.

The **impact severity is major**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is major**.

7.2.1.4.3.2 Mitigation measure and impact after mitigation

It is proposed to provide a temporary wastewater treatment plant dedicated to the site. (Phy-Wat-Av-3)

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of **negligible magnitude**

7.2.1.4.4 Impact Phy-Wat-W-Temp-4: Risks of accidental pollution

7.2.1.4.4.1 Impact before mitigation

Potential sources of accidental contamination are presented in section 7.2.1.3 Geotechnics and Hydrogeology of the karstic system.

The **impact severity is high**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is high**.

7.2.1.4.4.2 Mitigation measure and impact after mitigation

The mitigation of a contamination event consists mainly in the implementation of preventive measures to reduce risks during the construction phase.

Below is a short list of prevention measures for construction on construction sites:

- Provide sealed vats for polluting products stored in drums, tanks or cisterns in order to recover any spills.
- Avoid buried deposits of pollutants. If this is not possible, provide a system to quickly detect a possible leak.
- Provide a waterproof floor where harmful products are handled or delivered.
- Use the best technologies to limit the release of hazardous products.
- In the event of accidents, have an "intervention kit" at your disposal (absorbent products, etc.)

Development of a Risk Management Plan (RMP): a definition of RMP could be "The RMP will describe existing and proposed risk management measures that are to either continue or to be put in place to provide confidence that the identified threat activity will cease to be or not become a significant threat to drinking water". (Phy-Wat-Av/Mit-4)

The proposed measures result in low severity mitigated impact. Thus, The residual impact is of **negligible magnitude**.

7.2.1.4.5 Impact Phy-Wat-W-Temp-5: Risks associated with the desalination plant

7.2.1.4.5.1 Impact before mitigation

The following are assumptions given that the location, type and specifications of the desalination plant are not known to date.

Construction and operation activities could result in a variety of coastal zone impacts including impacts to air quality, to water quality, to marine life, disturbance of ecological important ecosystems (sand-dunes, seagrass beds and other important habitats by the siting of pipelines route), dredging and disposal of dredged material, noise, interference with public access and recreation. The most significant of these impacts are to air quality and water quality, which subsequently, the latter has adverse impacts on marine life and ecosystems⁸

The **impact severity is high**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is high**.

7.2.1.4.5.2 Mitigation measures and impact after mitigation

The mitigation measures are in the form of best engineering design /selection of appropriate SWRO desalination plant and good site practices/ Operation & Maintenance during operation.

Below is an overview of the possible mitigation measures:

- Adequate siting of the plant to minimize disturbance of the natural environment
- Reduce construction activity by preferring containerized units
- Adequate mode of sea water abstract to avoid/reduce Impingement and Entrainment of marine organisms through boreholes/beach wells
- Desalination method: a reverse osmosis plant is to be considered
- Optimize the use of chemicals for pre-treatment, post-treatment, maintenance and cleaning
- Adequate mode of brine management. As mentioned in section 5.6.4.2, a zero liquid discharge of the brine should be favoured, through the installation of an evapo-concentrator-condenser-crystallizer instead of rejecting the diluted brine in the natural environment

An assessment of the potential impacts associated with a desalination plant will be carried out in the final ESIA and provide adequate mitigation measures as part of the ESMP

The tender documents for construction will incorporate all relevant aspects of the ESMP; the contractor will contractually be required to apply all relevant aspects of the ESMP.

The proposed measures result in low severity mitigated impact. Thus, **the residual impact is of negligible to low magnitude**.

⁸ UNEP – Sea Water Desalination in the Mediterranean – Assessment and Guidelines - 2033

7.2.1.4.6 Summary

Table 83: Temporary Impact during Construction – Physical Environment - Water & wastewater

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Phy-Wat-W-Temp-1	Impact of water resource resulting from works water supply	Adverse	Major	Phy-Wat-Mit-1	Install a desalination plant to supply drinking water to the workers' camp	Negligible
Phy-Wat-W-Temp-2	Impact of works on water resource resulting from impact on karstic groundwater	Adverse	Major	Phy-Wat-Comp-2	Temporarily replace the Caverne Bouteille intake by a sea water pumping Upgrade Caverne Bouteille plant to enable it to provide drinking water from sea water Thus, temporarily provide drinking water from sea water to people currently connected to Caverne Bouteille plant	Negligible
Phy-Wat-W-Temp-3	Works waste water	Adverse	Major	Phy-Wat-Av-3	Works wastewater treatment plant	Negligible
Phy-Wat-W-Temp-4	Risk of accidental pollution	Adverse	High	Phy-Wat-Av/Mit-4	Preventive measures to reduce risks during the construction phase - Risk management plan	Negligible
Phy-Wat-W-Temp-5	Desalination plant	Adverse	High	Phy-Wat-Av/Mit-5	Good engineering design and best site practices to reduce the impacts Importance of ESMP & ESCP in the contractor's contract	Negligible to low

7.2.2 Biological environment

7.2.2.1 Terrestrial habitats and flora

None.

7.2.2.2 Terrestrial fauna

7.2.2.2.1 Impact BioT-Fau-W-Temp-1: Impacts on the native bat *Pteropus rodricensis*

The following potential effects of the construction and operation of the project on the native bat *Pteropus rodricensis* are identified as:

- Loss of foraging habitat.
- Impact of construction noise, dust, vibration, light disturbance during night works, and operational lighting.
- Mortality or injury on roads through vehicle strike.

The species has been seen flying high enough to avoid most of the risks coming from vehicle strike. Noise, vibration and dust are potential sources of nuisance but the species is not very present when flying over the project area. The species could feed from the many specimen of *Eleodendron orientale* on the study site or from any other trees that provide fruits. However, the area is generally sparsely forested and the potential for the species to feed within the project footprint is very low.



Figure 174: *Pteropus rodricensis* flying over the Anse Quitor nature reserve near the project

The number of specimens inside the area of influence or inside the project footprint is used to determine the impact severity. For this species, the number of specimens inside the area of influence is higher than 10, and the number of specimens inside the project footprint is considered 0.

The impact severity is low. Considering the receptor sensitivity assessed as high, the impact magnitude is low.

7.2.2.2.2 Mitigation measure and impact after mitigation

No measure is necessary.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of low magnitude.

7.2.2.2.3 Summary

Table : Temporary Impact during Construction - Biological Environment - Terrestrial Habitats & Fauna

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
BioT-Fau-W-Temp-1	Impact on <i>Pteropus rodricensis</i> (Chiroptera)	Adverse	Low	None	None	Low

7.2.2.3 Marine habitats

The main potential temporary impacts on marine habitats in the works phase are the:

- Degradation of natural habitats;
- Modification of ecological functionality.

The construction works (backfilling at sea for the construction of the new runway and the boat house and jetty facilities) are the primary potential source of these potential impacts.

7.2.2.3.1 Impact BioM-Hab-W-Temp-1: Degradation of coral reef dominated by *Acropora formosa* (Pointe Palmiste)

7.2.2.3.1.1 Impact before mitigation

Coral reef located at the Pointe Palmiste is likely to be degraded mainly during the backfilling phases. Indeed, the backfilling will induce a resuspension of fine particles. Resuspension of marine sediments could result in siltation and deposition of fine particles on habitats, including coral reefs. Sedimentation is a recognized stress factor, inhibiting most of their feeding patterns in various ways, including preventing symbiotic algae from accessing the light needed for photosynthesis.

Naturally, the study area is mainly composed of fine sediments. The coastal sector has torrential valleys that radiate from the centre of the island, spilling over a significant volume of detrital materials of various sizes during the rainy season. Topaze Bay is therefore turbid and often very muddy. Under typical weather conditions, the concentration of suspended particles in Topaze Bay is generally less than 20 mg.l⁻¹, rarely exceeding a concentration of 30 mg.l⁻¹.

The modelling results show a dispersion of the turbid plume at the level of the backfill areas (in the order of 60 to >500 mg.l⁻¹). At the exit of Topaze Bay and near Pointe Palmiste (coral reef), concentrations are between 10 and 40 mg.l⁻¹ depending on wind conditions.

The increase in turbidity in the environment and especially the duration of exposure could therefore deeply modify the plant and animal communities associated with the corals of Pointe Palmiste, although they are accustomed to natural variations in turbidity (land inflows).

The impact severity is medium. Considering the receptor sensitivity assessed as high, the impact magnitude is medium.

7.2.2.3.1.2 Mitigation measure and impact after mitigation

Reduction measure (BioM-Mit-1): Installation of a floating boom

In order to preserve the coral reef at Pointe Palmiste, a floating boom can be positioned around the backfill areas during works phase. It will confine sediments and prevent their resuspension in the marine environment, particularly in sensitive habitats such as corals.

Considering the taking into account of the measure, the magnitude of the mitigated impact is low.

The proposed measure result in a low severity mitigated impact. Thus, the mitigated impact is is of low magnitude.

A monitoring measure for the protection of the coral reef (marking and prohibition of access + monitoring / restoration...) is proposed in Chapter 9.

7.2.2.3.2 Impact BioM-Hab-W-Temp-2: Degradation of habitats dominated by macroalgae and seagrass

7.2.2.3.2.1 Impact before mitigation

In the same manner, habitats dominated by macroalgae and seagrass are likely to be degraded mainly during the backfilling phases. Indeed, the backfilling will induce a resuspension of fine particles. Resuspension of marine sediments could result in siltation and deposition of fine particles on habitats, including macroalgae and seagrass beds. Seagrass beds are aquatic plants (phanerogams) that need light to grow. Excess suspended solids in the water column could reduce access to light and prevent photosynthesis of plants, thereby altering or killing seaweeds.

Naturally, the study area is mainly composed of fine sediments. The coastal sector has torrential valleys that radiate from the centre of the island, spilling over a significant volume of detrital materials of various sizes during the rainy season. Topaze Bay is therefore turbid and often very muddy. Under typical weather conditions, the concentration of suspended particles in Topaze Bay is generally less than 20 mg.l⁻¹, rarely exceeding a concentration of 30 mg.l⁻¹.

The modelling results show a dispersion of the turbid plume at the level of the backfill areas (in the order of 60 to >500 mg.l⁻¹). The Crab Island sector does not seem to be affected by the resuspension of sediments. Thus, habitats dominated by seagrass beds will have been impacted. Only macro-algae habitats in southeast Topaze Bay will be impacted (stations 10, 17 and 35, 20 to 40 mg.l⁻¹, light wind condition).

The increase in turbidity in the environment and especially the duration of exposure could therefore profoundly modify the plant and animal communities associated with the macroalgae, although they are accustomed to natural variations in turbidity (land inflows).

The impact severity is medium. Considering the receptor sensitivity assessed as medium, the impact magnitude is low.

7.2.2.3.2.2 Mitigation measure and impact after mitigation

Although the mitigated impact is low, the reduction measure (BioM-Mit-1) will also confine sediments and prevent their resuspension in the marine environment, particularly in sensitive habitats such as macroalgae and seagrass.

Considering the taking into account of the measure, the magnitude of the mitigated impact is negligible.

The proposed measures result in a not significant severity mitigated. Thus, The residual impact is of negligible magnitude.

A monitoring measure for the assessment of turbidity is proposed in Chapter 9.

7.2.2.3.3 Impact BioM-Hab-W-Temp-3: Modification of ecological functionality

7.2.2.3.3.1 Impact before mitigation

The impact severity of marine habitats degradation is low. It can therefore be considered that the project will not be likely to modify the ecological functionalities of the habitats mentioned above.

The impact severity is not significant. Considering the receptor sensitivity assessed as high (coral reef), the impact magnitude is negligible.

7.2.2.3.3.2 Mitigation measure and impact after mitigation

As the impact magnitude is negligible, no mitigation measure is proposed.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of negligible magnitude.

7.2.2.3.4 Summary

Table 84: Temporary Impact during Construction - Biological Environment - Marine Habitats

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
BioM-Hab-W-Temp-1	Degradation of coral reef dominated by <i>Acropora formosa</i>	Adverse	Medium	BioM-Mit-1	Installation of a floating boom to confine sediments and prevent their resuspension in the marine environment	Low
BioM-Hab-W-Temp-2	Degradation of habitats dominated by macroalgae and seagrass	Adverse	Medium			Negligible
BioM-Hab-W-Temp-3	Modification of ecological functionality	Adverse	Negligible	none	-	Negligible

7.2.2.4 Marine species

7.2.2.4.1 Impact BioM-Spe-W-Temp -1: Ichthyofauna

7.2.2.4.1.1 Impact before mitigation

Ichthyofauna may be sensitive to the temporary effects of backfilling and the presence of flat boats. Potential impacts are of several types:

- Risks of destruction of areas of piscicultural interest (nurseries, spawning grounds, etc.);
- Disturbance or risk of injury due to noise generated by ships and works;
- Risk of asphyxiation by suspending particles;
- Decrease in trophic resource.

Noise

Concerning acoustic impact, fishes have the ability to avoid these exposures by maintaining a certain distance from the noise source. Moreover, the area of influence presents a low fish diversity.

The impact severity of the project related to the increase in noise on ichthyofauna is adverse, low, temporary and direct. The impact magnitude is low.

Environmental quality

The dispersion of the turbid plume will occur mainly in Topaz Bay, where natural turbidity conditions will be quite high. Since fish are mobile, they have the ability to escape the most turbid areas.

The impact severity of the project related to the increase in turbidity on ichthyofauna is adverse, low, temporary and direct. The impact magnitude is low.

The impact severity is low. Considering the receptor sensitivity assessed as low, **the impact magnitude is low.**

7.2.2.4.1.2 Mitigation measure and impact after mitigation

Although the mitigated impact is low, the reduction measure (BioM-Mit-1) will also confine sediments and prevent their resuspension in the marine environment.

Considering the taking into account of the measure, the magnitude of the mitigated impact is negligible.

The proposed measures result in a not significant severity mitigated. Thus, The residual impact is of **negligible magnitude.**

7.2.2.4.2 Impact BioM-Spe-W-Temp -2: Impact on marine turtles

7.2.2.4.2.1 Impact before mitigation

Marine turtles are sensitive to the temporary effects of backfilling and the presence of flat boats. Potential impacts are of several types:

- Disturbance or risk of injury due to noise generated by ships and works;
- Risk of asphyxiation by suspending particles;
- Decrease in trophic resource.

Noise

Within the framework of this project, the acoustic impacts could concern marine turtles. Nevertheless, Topaze Bay is not an important habitat for these species, as they only occasionally visit the Rodrigues lagoon (Crab Island could be a sea turtle spawning site).

The impact severity of the project related to the increase in noise on marine turtles is adverse, medium, temporary and direct. The impact magnitude is medium.

Impacts can be reduced with the implementation of mitigation measures such as the avoidance of backfilling during marine turtle spawning periods which would reduce the intensity and probability of the impact.

Environmental quality

The loss or degradation of seagrass habitats can also indirectly impact turtles. Indeed, marine seagrasses are a source of food for turtles. The modelling results show a dispersion of the turbid plume at the level of the backfill areas (in the order of 60 to >500 mg.l⁻¹). Crab Island sector does not seem to be affected by the resuspension of sediments. Thus, habitats dominated by seagrass beds will have been impacted.

The impacts severity of the project related to the increase in turbidity on marine turtles is adverse, low, temporary and direct. The impact magnitude is low.

The impact severity is medium. Considering the receptor sensitivity assessed as high, the impact magnitude is medium.

7.2.2.4.2.2 Mitigation measure and impact after mitigation

Reduction measure (BioM-Mit-2): Monitoring for the possible presence of turtles in the project area and egg laying site on Crab Island

In order to reduce the risk of disturbance of marine turtles during the spawning period, increased monitoring of the work area and beaches on Crab Island will be carried out. In the event that marine turtles are found in the lagoon near the work area or on the beaches of Crab Island, the noisiest work (backfilling at sea) must be stopped.

Considering the taking into account of the measure, the magnitude of the mitigated impact is low.

The proposed measure result in a low severity mitigated impact. Thus, the mitigated impact is of low magnitude.

A monitoring and census of marine turtles in the south of Rodrigues is proposed in Chapter 9.

7.2.2.4.3 Impact BioM-Spe-W-Temp -3: Impact on marine mammals

7.2.2.4.3.1 Impact before mitigation

The potential impacts of the project on marine mammals are identical to those of marine turtles.

Considering the five main species observed in the coastal waters of Rodrigues, only the Indo-Pacific bottlenose dolphin is likely to be encountered. This species remains coastal and sedentary, possibly isolated from other populations. This reflection is ongoing at the Mascarene scale for this species where scientific work has been initiated (Globice, pers. com.,

2015). Within the framework of this project, the acoustic impacts could concern this species. However, this dolphin is more common in coastal waters along the outer slope of the lagoon, occasionally coming into Topaze Bay (no proven long residences in this area).

The impact severity is low. Considering the receptor sensitivity assessed as medium, the impact magnitude is low.

7.2.2.4.3.2 Mitigation measure and impact after mitigation

As the impact magnitude is low, no mitigation measure is proposed.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of low magnitude.

7.2.2.4.4 Summary

Table 85: Temporary Impact during Construction - Biological Environment - Marine Species

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
BioM-Spe-W-Temp -1	Impact on Ichthyofauna : - Noise pollution related to marine works - Degradation of environmental quality - Destruction of species	Adverse	Low	None	-	Low
BioM-Spe-W-Temp -2	Impact on Marine turtles : - Noise pollution related to marine works - Degradation of environmental quality - Destruction of species	Adverse	Medium (noise and pollution)- Low	BioM-Mit-2	Monitoring for the possible presence of turtles in the project area and egg laying site on Crab Island	Low
BioM-Spe-W-Temp -3	Impact on Marine mammals Noise pollution related to marine works - Degradation of environmental quality - Destruction of species	Adverse	Low-negligible	None	-	Low-negligible

7.2.3 Transport network, electricity supply and waste management

7.2.3.1 Transport network

7.2.3.1.1 Impact Trspt-W-Temp-1: Impact on the transport network

7.2.3.1.1.1 Impact before mitigation

Road

During the works phase, the road network will be affected by:

- The circulation of construction machinery around the study area;
- Convoys of construction materials arriving in Port Mathurin by boat which will have to be transferred to Plaine Corail airport.

These factors will increase and slow down road traffic.

Air

Some of the construction materials could be transported by air, directly to Plaine Corail airport.

This should not affect the passenger air traffic, however, the cargo traffic could be increased.

Maritime routes

As for the air traffic, there should be only minor impact on the port traffic of Rodrigues.

The supply of materials will lead to an increase in the volume of goods arriving at the port. However, this will only have a little impact on passenger traffic or other freight traffic.

The impact severity is low. Considering the receptor sensitivity assessed as low, **the impact magnitude is low.**

7.2.3.1.1.2 Mitigation measure and impact after mitigation

The transfer of equipment can be done either in the early morning or at night to set minimum disruption on road traffic (measure Inf-Mit-1).

For the mobilization of construction equipment; a police escort is provided for such special convoys. A prior survey is normally done before the transfer of equipment from Mauritius. An approval of the commission for public infrastructure is normally sought prior to shipment from Mauritius (measure Inf-Mit-2).

According to the local commission in charge of roads management, the works road traffic doesn't require specific arrangement with regard to maximum allowable equipment weight. However, in order to prevent the roads degradation by trucks traffic, the contractor will have to plan the roads rehabilitation as many times as needed during the works and at least at the end of the works (measure Inf-Mit-3).

The proposed measures result in a low severity mitigated impact. Thus, **The residual impact is of low magnitude.**

7.2.3.2 Electricity supply

7.2.3.2.1 Impact Elec-W-Temp-1: Impact on electricity supply

7.2.3.2.1.1 Impact before mitigation

The construction will require electricity use.

This electricity may come from the general electricity network or from specific generators.

The impact severity is low. Considering the receptor sensitivity assessed as low, **the impact magnitude is low.**

7.2.3.2.1.2 Mitigation measure and impact after mitigation

In order to avoid overloading the power consumption, the work can be adapted as far as possible during electric underload periods (measure Inf-Mit-3).

In addition, the use of generators may limit the electricity drawn from the island's general network (measure Inf-Mit-4).

The proposed measures result in a low severity mitigated impact. Thus, **The residual impact is of low magnitude.**

7.2.3.3 Solid waste management

7.2.3.3.1 Impact Sol-Wst-W-Temp-1: Impact on the solid waste management

7.2.3.3.1.1 Impact before mitigation

The construction phase will generate two types of construction site waste:

- conventional household waste;
- construction site building waste, which may result from the destruction of existing buildings.

The impact severity is low. Considering the receptor sensitivity assessed as low, **the impact magnitude is low.**

7.2.3.3.1.2 Mitigation measure and impact after mitigation

The solid waste which is like household waste will be managed with the rest of the island's waste.

Construction site waste will be maximally recovered through recycling and reuse.

The proposed measures result in a low severity mitigated impact. Thus, **The residual impact is of low magnitude.**

7.2.3.4 Summary

Table 86: Temporary Impact during Construction - Transport Network, Electricity Supply & Waste Management

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Trspt-W-Temp-1	Impact on the transport network	Adverse	Low	Inf-Mit-1	Transfer materials out of high traffic periods	Low
				Inf-Mit-2	Anticipate and supervise exceptional convoys	
				Inf-Mit-3	Rehabilitate roads that were used during construction and at the end of works	
Elec-W-Temp-1	Impact on electricity supply	Adverse	Low	Inf-Mit-3	Adapt the period of work	Low
				Inf-Mit-4	Use generators	
Sol-Wst-W-Temp-1	Impact on the solid waste management	Adverse	Low	Inf-Mit-5	Recycling and reuse of materials	Low

7.2.4 Socio-economic environment

7.2.4.1 Impacts on demographics and social dynamics

7.2.4.1.1 Impact SE-Demo-W-Temp-1: Increase of the population of Plaine Corail and its surroundings

Source of the impact: Migration of Mauritian or foreign workers and workers from other communities in Rodrigues

7.2.4.1.1.1 Impact before mitigation

With the advent and temporary installation of Mauritian or foreign workers on the project area level, the local population is expected to increase during the construction phase, which could influence the habits of the inhabitants.

This temporary impact can lead to changes in social dynamics within local communities as a result of population growth in the area.

The impact severity is low. Considering the receptor sensitivity assessed as low, **the impact magnitude is low.**

7.2.4.1.1.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Provide support and communication measures to local populations facilitating the integration of external workers. (Measure SE-Mit-5):
- Organize information meetings at the level of the towns affected by the project
- Communicate transparently about the procedures for direct and indirect hiring of the project (opportunities, skills and education levels required)
- Develop and implement a workforce management plan that includes a management and quality policy concerning the accommodation of external workers
- Prepare a training program for employees and a training plan for communities in collaboration with regional administrative authorities
- Implement an influx management plan that includes appropriate communication from outside workers on local methods of operation and customs. (Measure SE-Mit-6):
- Develop and implement a workforce management plan that includes a management and quality policy concerning the accommodation of external workers
- Prepare a training program for employees and a training plan for communities in collaboration with regional administrative authorities

These mitigation measures will limit the magnitude of the impact to a negligible level.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of **negligible magnitude.**

7.2.4.1.2 Impact SE-Demo-W-Temp-2: Evolutions of internal relations and in relation to foreign influx

Source of the impact: Migration of Mauritian or foreign workers and workers from other communities in Rodrigues

7.2.4.1.2.1 Impact before mitigation

The prolonged contact of the surrounding communities with the populations of migrant workers during the construction phase can change local perceptions towards foreigners. This potential impact can lead to possible tensions between host communities and visitors in case of cultural disparities that are too significant and misunderstood practices.

The impact severity is medium. Considering the receptor sensitivity assessed as medium, the impact magnitude is medium.

7.2.4.1.2.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Provide support and communication measures to local populations to facilitate the integration of external workers. (Measure SE-Mit-5 – see 7.2.4.1.1.2)
- Implement an influx management plan that includes appropriate communication from outside workers on local methods of operation and customs. (Measure SE-Mit-6 see 7.2.4.1.1.2)

These mitigation measures will limit the magnitude of the impact to a negligible level.

The proposed measures result in a medium severity mitigated impact. Thus, the residual impact is of negligible magnitude.

7.2.4.1.3 Impact SE-Demo-W-Temp-3: Social tensions arising from hiring conditions

Source of the impact: Creation of direct and indirect jobs for construction work

7.2.4.1.3.1 Impact before mitigation

The recruitment of workers for the construction of the Plaine Corail airport can lead to the emergence of social tensions if the hiring conditions are not clearly stated among the local people who are waiting for these employment opportunities.

Communities in the vicinity of the affected area are very sensitive to being considered in recruitment measures for construction, there may be conflicts and a sense of rejection.

The consideration of the inhabitants of the towns in the perimeter of the project is to be noted in order to limit the emergence of social tensions of the communities towards the project.

The impact severity is low. Considering the receptor sensitivity assessed as medium, the impact magnitude is low.

7.2.4.1.3.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a workforce management plan incorporating a transparent recruitment process and the promotion of recruitment of young people from the surrounding communities. (Measure SE-Mit-7):
- Organize information meetings at the level of the towns affected by the project

- Communicate transparently about the procedures for direct and indirect hiring of the project (opportunities, skills and education levels required)
- Establish a framework for consultation with regular meetings (local authorities, communities, ARL, RRA) to address public development initiatives
- Develop and implement a workforce management plan that includes a description of working conditions and hiring conditions
- Ensure the implementation of a recruitment policy favouring local citizens and prioritizing the resettled people and the affected local communities
- Prepare a training program for employees and a training plan for communities in collaboration with regional administrative authorities
- Carry out an inventory of local skills within the framework of the training and skill-building action plan in order to prioritise the employment of those directly affected by the project
- Implement a regular communication and complaint management plan for local communities. (Measure SE-Mit-8):
- Use an effective and transparent complaint management mechanism at project level and communicate this mechanism to the authorities and towns impacted by the project activities
- Communicate transparently about the procedures for direct and indirect hiring of the project (opportunities, skills and education levels required)
- Establish a complaint management mechanism that is widely known to local stakeholders (local authorities and populations affected directly or indirectly by the project) and works in an efficient and transparent manner
- Develop and implement a workforce management plan that includes a worker complaint management process
- Develop and implement a workforce management plan that includes a worker awareness program that includes ways of informing workers about their rights through training or communication campaigns
- Prepare a training program for employees and a training plan for communities in collaboration with regional administrative authorities

The proposed measures result in a low severity mitigated impact. Thus, the residual impact is of **negligible magnitude**.

7.2.4.1.4 Impact SE-Demo-W-Temp-4: Temporary employment opportunities for neighbouring residents

Source of the impact: Creation of direct and indirect jobs for construction work

7.2.4.1.4.1 Positive impact

The construction created by the project of expansion of the runway will open up employment opportunities for the inhabitants of the airport area which can lead to the creation of constructive social dynamics (such as female association or small business set up) within the local communities.

The hiring of the inhabitants of neighbouring towns is a positive impact on the communities concerned for the social cohesion of the town.

The impact severity is medium. Considering the receptor sensitivity assessed as medium, the impact magnitude is low.

7.2.4.1.4.2 Improvement measure and resulting improved impact

To improve this impact, it is proposed to:



- Implement a regular communication plan with local communities to inform residents about unskilled job opportunities at project level. (Measure SE-Mit-7 – see 7.2.4.1.3.2)
 - Communication plan for the integration of external workers (SE-Mit-5 - see 7.2.4.1.1.2)
- This improvement measure will increase the magnitude of the impact to a medium level as job opportunities provided by the project will mainly concern younger inhabitants in a working capacity.

The proposed measures result in a medium severity mitigated impact. Thus, the residual impact is of **medium magnitude**.

7.2.4.1.5 Summary

Table 87: Temporary Impact during Construction - Socio-Economic Environment - demographics and social dynamics

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Demo-W-Temp-1	Increase of the population of Plaine Corail and its surroundings	Adverse	Low	SE-Mit-5	Mitigation - Communication plan for the integration of external workers.	Negligible
				SE-Mit-6	Mitigation - Influx management plan	
SE-Demo-W-Temp-2	Evolutions of internal relations and in relation to foreign influx	Adverse	Medium	SE-Mit-5	Mitigation : Mitigation - Communication plan for the integration of external workers.	Negligible
				SE-Mit-6	Mitigation - Influx management plan	
SE-Demo-W-Temp-3	Social tensions arising from hiring conditions	Adverse	Low	SE-Mit-7	Mitigation - Communication and hiring management plan	Negligible
				SE-Mit-8	- Communication and complaint management plan connected with employment	
SE-Demo-W-Temp-4	Temporary employment opportunities for neighbouring residents	Positive	Low	SE-Mit-5	Mitigation - Communication and hiring management plan	Medium

7.2.4.2 Impacts on power, governance and civil society

7.2.4.2.1 Impact SE-Gov-W-Temp-1: Risk of tension between the displaced community and the host community (cumulative impact)

Source of the impact: Involuntary displacement of the populations affected by the project

7.2.4.2.1.1 Impact before mitigation

The involuntary displacement of the populations affected by the project caused the relocation of the Sainte Marie inhabitants and the users of the impacted area such as livestock breeders and fishermen. The integration of these communities will have to consider the populations of the proposed relocation areas. In fact, it is probable that tensions will arise relating to the adaptation of lifestyles, space management and governance.

All of the communities mentioned here are potentially sensitive receptors and if support measures adapted and oriented to the two communities are not put in place, a sense of injustice could occur.

The impact severity is medium. Considering the receptor sensitivity assessed as low, the impact magnitude is low.

7.2.4.2.1.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

Implement a communication plan (including complaint management) and internal support for all displaced residents and those in the towns within the proposed relocation areas. This plan must incorporate a regular consultation process to collect the source of dissatisfaction and to obtain solutions formulated by the communities themselves. (Measure SE-Mit-3):

- Organize information meetings at the level of the towns affected by the project
- Use an effective and transparent complaint management mechanism at project level and communicate this mechanism to the authorities and towns impacted by the project activities
- Develop and adopt a continuous and transparent communication strategy concerning the issues of displacement and relocation
- Establish a complaint management mechanism that is widely known to local stakeholders (local authorities and populations affected directly or indirectly by the project) and works in an efficient and transparent manner

These mitigation measures will limit the magnitude of the impact to a negligible level.

The proposed measures result in a medium severity mitigated impact. Thus, the residual impact is of negligible magnitude.

7.2.4.2.2 Summary

Table 88: Temporary Impact during Construction - Socio-Economic Environment - Power, Governance & Civil Society

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Gov-W-Temp-1	Risk of tension between the displaced community and the host community (cumulative impact)	Adverse	Low	SE-Mit-3	Mitigation - Communication plan, complaint management and internal support for relocation.	Negligible

7.2.4.3 Impacts on land

7.2.4.3.1 Impact SE-Land-W-Temp-1: Increase in social tensions in relation to the land resource (cumulative impact)

Source of the impact: Involuntary displacement of the populations affected by the project

7.2.4.3.1.1 Impact before mitigation

The risk of the emergence of social tensions in relation to land use resources is a potential problem to be considered between communities that will need to be displaced and communities in the proposed relocation areas. In addition to habitat, it particularly involves land use related to agriculture and pastures that may be the source of potential tension.

All of the communities in the area directly impacted by the construction project as well as the towns proposed for relocation are the direct receptors of this potentially major impact of pressure on agro-pastoral systems. Accompanying measures must mandatorily be taken to minimize this negative impact.

The impact severity is major. Considering the receptor sensitivity assessed as major, the impact magnitude is major.

7.2.4.3.1.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to implement a communication plan (including a complaint management plan) and internal support to all villagers, displaced users and residents of the towns within the proposed relocation areas. This plan must incorporate a regular consultation process to collect sources of dissatisfaction and to obtain solutions formulated by the communities themselves. (Measure SE-Mit-3 – see 7.2.4.2.1.2)

These mitigation measures will limit the magnitude of the impact to a medium level as land resource remains a sensitive element that particularly needs to be followed up.

The proposed measures result in a major severity mitigated impact. Thus, The residual impact is of medium magnitude.

7.2.4.3.2 Impact SE-Land-W-Temp-2: Evolution of land management procedures (cumulative impact)

Source of the impact: Involuntary displacement of the populations affected by the project

7.2.4.3.2.1 Impact before mitigation

The involuntary displacement of the population affected by the construction project will entail a necessary adaptation of the different communities to the use of space. Indeed, the relocation of Sainte Marie villagers to proposed resettlement areas will call for a certain organisation with existing village communities. This is particularly relevant for agricultural land and in particular livestock breeding, the main activity of all the inhabitants of the area.

The main receptors of this irreversible impact on livestock-related land management are the inhabitants of the towns approached for relocation and of course the Sainte Marie villagers, and the Bangélique area livestock breeders.

The **impact severity is major**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is major**.

7.2.4.3.2.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement an internal support plan for all villagers, displaced users and residents of towns in the proposed relocation areas. This plan must incorporate a regular consultation process to organise the management of complaints and to obtain proposals for solutions formulated by the communities themselves. (Measure SE-Mit-3 – see 7.2.4.2.1.2)
- Implement integrated technical support measures to facilitate specific adaptation to new agricultural management and pasture parcels. (Measure SE-Mit-9):
- Develop programs to support agricultural and agro-pastoral development in order to make the best use of the territory's resources and adapt land uses
- Improve access to water in proposed areas such as the resettlement areas

These mitigation measures will limit the magnitude of the impact to a medium level as land management remains an important concern for the locals.

The proposed measures result in a **major severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

7.2.4.3.3 Summary

Table 89: Temporary Impact during Construction - Socio-Economic Environment - Land

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Land-W-Temp-1	Increasing social tensions in relation to the land resource	Adverse	Major	SE-Mit-3	Mitigation - Communication plan, complaint management and internal support for relocation.	Medium
SE-Land-W-Temp-2	Evolution of land management procedures	Adverse	Major	SE-Mit-3	Mitigation - Communication plan, complaint management and internal support for relocation.	Medium
				SE-Mit-9	Mitigation - Agricultural technical support plan.	

7.2.4.4 Impacts on agriculture and livestock

7.2.4.4.1 Impact SE-Agri-W-Temp-1: Decrease in income from agriculture during the adjustment period (cumulative impact)

Source of the impact: Loss of farmland

7.2.4.4.1.1 Impact before mitigation

The relocated Sainte Marie villagers will have to cultivate new parcels that have not necessarily been farmed before. The soils of the area are generally shallow and a period of rehabilitation will most likely be necessary to attain the level of fertility currently possessed by the village parcels.

Harvests are likely to be lower during the first years of cultivation and thus agricultural incomes will decline. In addition, while these incomes generally do not represent the most important part of household incomes, they are a necessity for their social equilibrium.

The **impact severity is high**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is high**.

7.2.4.4.1.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to implement follow-up procedures in the RAP to provide agricultural and economic technical support to communities during their period of adaptation and integration into their new environment. (Measure SE-Mit-10):

- Organize information meetings at the level of the towns affected by the project
- Use an effective and transparent complaint management mechanism at project level and communicate this mechanism to the authorities and towns impacted by the project activities
- Conduct consultations with potentially impacted villages to prepare for the implementation of the Resettlement Action Plan
- Develop and adopt a continuous and transparent communication strategy concerning the issues of displacement and relocation
- Establish a complaint management mechanism that is widely known to local stakeholders (local authorities and populations affected directly or indirectly by the project) and works in an efficient and transparent manner
- Ensure that the implementation of the Resettlement Action Plan (RAP) is in line with the project's commitments for the resettlement and restoration of livelihoods and IFC standards
- Compensate land and infrastructure on the basis of a plan to manage individual and community compensation by land as much as possible, cover losses incurred for both individuals and the community
- Develop a Livelihood Restoration Plan for communities that will be affected by "economic displacement" (loss of property and/or livelihoods) and establish a monitoring-assessment program of the socio-economic conditions of displaced people
- Create a Resettlement Monitoring Committee for helping the follow up and ensuring the proceedings of activities and procedures

These mitigation measures will limit the magnitude of the impact to a medium level due to the still important role of crops in households.

The proposed measures result in a **high severity mitigated impact**. Thus, **The residual impact is of medium magnitude**.

7.2.4.4.2 Impact SE-Agri-W-Temp-2: Decrease in livestock breeding activity (cumulative impact)

Source of the impact: Loss of farmland

7.2.4.4.2.1 Impact before mitigation

The relocation of the Sainte Marie villagers and the Bangélique livestock breeders will potentially lead to a direct impact on the livestock activity. The majority of the livestock breeding in the area currently planned for construction will be located in the vicinity of the proposed relocation area, in addition to the herds already present. This could lead to an overgrazing of the area and an obligation for livestock breeders to restrict livestock if livestock breeding methods do not adapt.

However, the likelihood of declining livestock is not too large if support measures are taken. These measures are indispensable because livestock breeding is a major issue for the communities concerned.

The impact severity is major. Considering the receptor sensitivity assessed as major, the impact magnitude is major.

7.2.4.4.2.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Support livestock breeders from different communities in the establishment of semi-intensive farming methods in order to maintain herd sizes. (Measure SE-Mit-11):
- Organize information meetings at the level of the towns affected by the project
- Use an effective and transparent complaint management mechanism at project level and communicate this mechanism to the authorities and towns impacted by the project activities
- Develop and adopt a continuous and transparent communication strategy concerning the issues of displacement and relocation
- Establish a complaint management mechanism that is widely known to local stakeholders (local authorities and populations affected directly or indirectly by the project) and works in an efficient and transparent manner
- Develop programs to support agricultural and agro-pastoral development in order to make the best use of the territory's resources and adapt land uses
- Establish a visit and consultation timetable for the communities in regard to specific integration topics of the displaced herds in their new environment and the evolution of the agro-pastoral system. (Measure SE-Mit-12):
- Organize information meetings at the level of the towns affected by the project
- Develop programs to support agricultural and agro-pastoral development in order to make the best use of the territory's resources and adapt land uses
- Support livestock breeding by allowing for the creation of water points and creating fodder perimeters for livestock
- Improve access to water in proposed areas such as the resettlement areas

These mitigation measures will limit the magnitude of the impact to a medium level as livestock represents a major socio-economic component for local communities.

The proposed measures result in a **major severity mitigated impact**. Thus, **The residual impact is of medium magnitude**.

7.2.4.4.3 Impact SE-Agri-W-Temp-3: Change of livestock breeding practices due to the reduction in available pasture land (cumulative impact)

Source of the impact: Decrease in livestock breeding activity

7.2.4.4.3.1 Impact before mitigation

The Sainte Marie villagers and the Bangélique livestock breeders will have to raise their cattle on proposed areas close to the town of Plaine Corail. The fact that this area is already used as pastureland by other livestock breeders could lead to a general change in the way cattle is managed. It should be foreseen that the actual extent must be reviewed and the practices must be adapted, potentially through an adequate breeding intensification.

This is a very important issue for livestock breeders and is to be considered because the measures to be taken will shape the future of the livestock breeding of the area.

The **impact severity is high**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is high**.

7.2.4.4.3.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Support livestock breeders from different communities in the establishment of semi-intensive farming methods in order to maintain herd sizes. (Measure SE-Mit-11 – see 7.2.4.4.4.2)
- Establish a visit and consultation timetable for the communities in regard to specific integration topics of the displaced herds in their new environment and the evolution of the agro-pastoral system. (Measure SE-Mit-12 – see 7.2.4.4.4.2)

These mitigation measures will limit the magnitude of the impact to a medium level as livestock represents a major socio-economic component for local communities.

The proposed measures result in a **high severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

7.2.4.4.4 Impact SE-Agri-W-Temp-4: Increase in the rehabilitation time of agricultural surfaces (cumulative impact)

Source of the impact: Decrease in livestock breeding activity

7.2.4.4.4.1 Impact before mitigation

The decrease in livestock activity will simultaneously decreases the contribution of organic matter from animal origins, limiting the changes of cultivated soils and therefore can extend the period necessary for the regeneration of soils for crops.

Soil fertility is an important issue for local communities where agricultural plants represent a significant part of the economic and social functioning.

The **impact severity is high**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is high**.



7.2.4.4.4.2 Mitigation measures and impact after mitigation

- Support livestock breeders from different communities in the establishment of semi-intensive farming methods in order to maintain herd sizes. (Measure SE-Mit-11 – see 7.2.4.4.4.2)
- Establish a visit and consultation timetable for the communities in regard to specific integration topics of the displaced herds in their new environment and the evolution of the agro-pastoral system. (Measure SE-Mit-12 – see 7.2.4.4.4.2)

These mitigation measures will limit the magnitude of the impact to a medium level as soil rehabilitation is a long process.

The proposed measures result in a high severity mitigated impact. Thus, the residual impact is of medium magnitude.

7.2.4.4.5 Summary

Table 90: Temporary Impact during Construction - Socio-Economic Environment - Agriculture & Livestock

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Agri-W-Temp-1	Decrease in income from agriculture during the adjustment period	Adverse	High	SE-Mit-10	Mitigation - RAP follow-up plan	Medium
SE-Agri-W-Temp-2	Decrease in livestock breeding activity	Adverse	Major	SE-Mit-11	Mitigation - Community consultation plan for monitoring the evolution of the agro-pastoral system.	Medium
				SE-Mit-12	Mitigation - Support plan concerning livestock breeding techniques.	
SE-Agri-W-Temp-3	Change of livestock breeding practices due to the reduction in available pasture land	Adverse	High	SE-Mit-11	Mitigation - Community consultation plan for monitoring the evolution of the agro-pastoral system.	Medium
				SE-Mit-12	Mitigation - Support plan concerning livestock breeding techniques.	
SE-Agri-W-Temp-4	Increase in the rehabilitation time of agricultural surfaces	Adverse	High	SE-Mit-11	Mitigation - Community consultation plan for monitoring the evolution of the agro-pastoral system.	Medium
				SE-Mit-12	Mitigation - Support plan concerning livestock breeding techniques.	

7.2.4.5 Impacts on the local economic context

7.2.4.5.1 Impact SE-Eco-W-Temp-1: Decrease in household incomes due to the potential decrease in the livestock (or even agricultural) activity of the people affected (indirect impact)

Source of the impact: Reduction of agriculture, livestock and fishing activities

7.2.4.5.1.1 Impact before mitigation

The reduction of agricultural and fishing activities in the entire airport area undoubtedly impacts household incomes since these activities are the main and often the only income source of households.

This is a major socio-economic issue and the sensitivity of all households is definitely very high.

The impact severity is major. Considering the receptor sensitivity assessed as major, the impact magnitude is major.

7.2.4.5.1.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Ensure follow-up on the establishment of the Resettlement Action Plan (RAP) respecting the resettlement, livelihood restoration commitments and complying with the IFC standards. (Measure SE-Mit-10 – see 7.2.4.4.1.2)
- Establish a visit and consultation timetable for the communities in regard to the specific subjects of adaptation of the displaced and host communities to the changes observed in the income-generating activities. (Measure SE-Mit-14):
- Organize information meetings at the level of the towns affected by the project
- Develop and adopt a continuous and transparent communication strategy concerning the issues of displacement and relocation
- Establish a framework for consultation with regular meetings (local authorities, communities, airport, Rodrigues government) to address public development initiatives
- Conduct consultations with potentially impacted villages to prepare for the implementation of the Resettlement Action Plan
- Compensate land and infrastructure on the basis of a plan to manage individual and community compensation by land as much as possible, cover losses incurred for both individuals and the community
- Develop a Livelihood Restoration Plan for communities that will be affected by "economic displacement" (loss of property and/or livelihoods) and establish a monitoring-assessment program of the socio-economic conditions of displaced people
- Support the diversification of income-generating economic activities in the context of the Livelihood Restoration Plan so that people affected by the project can regain sustainable livelihoods and possibly invest in these activities a part of the financial indemnifications resulting from the RAP
- Support projects for the development of income-generating activities aimed at internally displaced people, in particular people displaced due to economic reasons
- Promote local economic development initiatives to accompany the people and communities affected by the project
- Reinforce or create income-generating activities, in particular those carried out by women

- Develop programs to support economic diversification and the development of income-generating activities (e.g. crafts, trade, services and processing of agricultural and fishery products)

These mitigation measures will limit the magnitude of the impact to a medium level as incomes from farming and fishing represent a socio-economic pillar of households.

The proposed measures result in a **major severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

7.2.4.5.2 Impact SE-Eco-W-Temp-2: Increase in local production prices (indirect impact)

Source of the impact: Reduction of agriculture, livestock and fishing activities

7.2.4.5.2.1 Positive impact

The reduction of activities related to agriculture, livestock and fisheries leads to a decrease in production and a decline in marketed quantities that encourages the increase in local production prices.

This impact can be positive due to the fact that this can help to improve the incomes of producers, livestock breeders and fishermen.

The **impact severity is medium**. Considering the **receptor sensitivity assessed as medium**, **the impact magnitude is low**.

7.2.4.5.2.2 Improvement measure and impact after improving

To promote this impact, it is proposed to:

- Promote the establishment of a timetable for visits and consultations of all the communities in the area in relation to the specific subjects of adaptation of the displaced and host communities to the changes observed in the income-generating activities. (Measure SE-Mit-14 – see 7.2.4.5.1.2)
- Create a favourable economic framework to enable households to balance income from income-generating activities. (Measure SE-Mit-15):
- Organize information meetings at the level of the towns affected by the project
- Develop and adopt a continuous and transparent communication strategy concerning the issues of displacement and relocation (only during operating phase)
- Establish a framework for consultation with regular meetings (local authorities, communities, airport, Rodrigues government) to address public development initiatives

These improvement measures will permit the achievement of an impact magnitude at a high level.

The proposed measures result in a **medium severity mitigated impact**. Thus, **the improved impact is of high magnitude**.

7.2.4.5.3 Impact SE-Eco-W-Temp-3: Increase in local production prices (cumulative impact)

Source of the impact: Reduction of agriculture, livestock and fishing activities

7.2.4.5.3.1 Impact before mitigation

A decrease in the quantities marketed for agricultural or fishing products is an incentive to increase local production prices. However, this impact can also be seen as a negative impact on households in towns that see their purchasing power decrease. In this regard, household sensitivity is highly characterized making it an impact considered as high.

The **impact severity is high**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is high**.

7.2.4.5.3.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Establish a visit and consultation timetable for all the communities in the area in relation to the specific subjects of adaptation of the displaced and host communities to the changes observed in the income-generating activities. (Measure SE-Mit-14 – see 7.2.4.5.1.2)
- Create a favourable economic framework to enable households to balance income from income-generating activities. (Measure SE-Mit-15 – see 7.2.4.5.2.2)

These mitigation measures will limit the magnitude of the impact to a medium level as particular attention will have to be taken for local purchasing power.

The proposed measures result in a **high severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

7.2.4.5.4 Impact SE-Eco-W-Temp-4: Increase in local development initiatives (cumulative impact)

Source of the impact: Reduction of agriculture, livestock and fishing activities

7.2.4.5.4.1 Positive impact

The reduction of agricultural or fishing activities may lead to the establishment and development of other activities to generate sufficient incomes for households in the communities or create opportunities for local entrepreneurship (e.g. through the women's association) that will respond to a growing demographic demand.

This positive impact concerns all the communities in the airport area and its environs and specifically those that will comprise the relocation areas of the villagers of Sainte Marie. This potentiality represents a considerable stake for all the communities.

The **impact severity is medium**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is medium**.

7.2.4.5.4.2 Improvement measure and impact after improving

To promote this impact, it is proposed to:

- Establish a visit and consultation timetable in regard to the specific subjects of adaptation of the displaced and host communities to the changes observed in the income-generating activities. (Measure SE-Mit-14 – see 7.2.4.5.1.2)

- Implement measures supporting households in order to integrate initiatives proposed by the communities into the local economic context. (Measure SE-Mit-15 – see 7.2.4.5.2.2)

These improvement measures will produce an impact magnitude at a high level.

The proposed measures result in a **medium severity mitigated impact**. Thus, **the improved impact is of high magnitude**.

7.2.4.5.5 Impact SE-Eco-W-Temp-5: Increase in household incomes (cumulative impact)

Source of the impact: Creation of direct and indirect jobs

7.2.4.5.5.1 Positive impact

The project can create jobs within the surroundings for the local population and even for women during the various phases of project management, with great potentialities during works phase. This job creation will undeniably lead to increase in household income security in surrounding towns.

This positive impact here concerns all communities in relation to the project and represents a strong socio-economic issue for the project area.

The **impact severity is high**. Considering the **receptor sensitivity assessed as medium**, **the impact magnitude is medium**.

7.2.4.5.5.2 Improvement measure and impact after improving

To promote this impact, it is proposed to:

- Implement a workforce management plan incorporating a transparent recruitment process, promoting the recruitment of young people from the surrounding communities. (Measure SE-Mit-7 – see 7.2.4.1.3.2)
- Implement a regular communication plan with local communities. (Measure SE-Mit-7 – see 7.2.4.1.3.2)

These improvement measures will produce an impact magnitude at a high level.

The proposed measures result in a **high severity mitigated impact**. Thus, **the improved impact is of high magnitude**.

7.2.4.5.6 Impact SE-Eco-W-Temp-6: Necessary adaptation to the new local economic landscape (cumulative impact)

Source of the impact: Creation of direct and indirect jobs

7.2.4.5.6.1 Impact before mitigation

The creation of direct and indirect jobs implies a potential change in the local economic landscape, including the emergence of various companies creating an interesting economic dynamic in the airport area.

This impact can potentially be considered adverse to a lesser extent if specific support is not provided in order to harmonize future economic developments. While it may be classified as low-magnitude, this potential impact is nonetheless an issue to be taken into consideration.

The **impact severity is medium**. Considering the **receptor sensitivity assessed as medium**, **the impact magnitude is low**.

7.2.4.5.6.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a regular communication plan with local communities. (Measure SE-Mit-14 – see 7.2.4.5.1.2)
- Implement a management plan for local economic development to propose a harmonisation of community-based initiatives in response to the changing economic environment of the area. (Measure SE-Mit-15 – see 7.2.4.5.2.2)

These mitigation measures will permit the limitation of the impact's magnitude to a negligible level

The proposed measures result in a **medium severity mitigated impact**. Thus, **the residual impact is of negligible magnitude**.

7.2.4.5.7 Impact SE-Eco-W-Temp-7: Collaborative partnership or operational opportunities between local communities (indirect impact)

Source of the impact: Creation of direct and indirect jobs

7.2.4.5.7.1 Positive impact

The potential for creating direct and indirect jobs can lead to the development of socio-economic projects involving the various parts of the surrounding towns of the airport project. The presence of a favourable economic and social environment triggers opportunities for groupings of skills and thus the creation of partnerships.

This impact permits the establishment and maintenance of a positive socio-economic network within communities and can be of considerable importance.

The **impact severity is medium**. Considering the **receptor sensitivity assessed as medium**, **the impact magnitude is medium**.

7.2.4.5.7.2 Improvement measure and impact after improving

To promote this impact, it is proposed to:

- Implement a regular communication plan with local communities. (Measure SE-Mit-15 – see 7.2.4.5.2.2)
- Implement a management plan for local economic development to propose a harmonisation of community-based initiatives in response to the changing economic environment of the area. (Measure SE-Mit-15 – see 7.2.4.5.2.2)

These mitigation measures will limit the magnitude of the impact to a medium level.

The proposed measures result in a **medium severity mitigated impact**. Thus, **the improved impact is of medium magnitude**.

7.2.4.5.8 Impact SE-Eco-W-Temp-8: Reinforcement of professional skills (cumulative impact)

Source of the impact: Creation of direct and indirect jobs

7.2.4.5.8.1 Positive impact

New job creation opportunities during the various phases of the project represent a strong potential to reinforce the professional skills of the surrounding populations, who will then have the opportunity to have access to certain professions inexistent until now in the area and therefore receive specific training to respond to the demand.

This impact represents a highly positive opportunity for the local people and more evidently for the younger generations, who will complement the local skills palette and the citizens of Rodrigues more generally.

The impact severity is high. Considering the receptor sensitivity assessed as medium, the impact magnitude is medium.

7.2.4.5.8.2 Improvement measure and impact after improving

To promote this impact, it is proposed to:

- Implement a regular communication plan with local communities. (Measure SE-Mit-7 – see 7.2.4.1.3.2)
- In the proposal plan for project hiring, ensure a distribution in order to foster the relationship between the experienced workers and the young people of the surrounding towns which are less experienced. (Measure SE-Mit-7 – see 7.2.4.1.3.2)
- Identify opportunities for economic development from local initiatives to provide training and coaching plans to reinforce professional skills. (Measure SE-Mit-15 – see 7.2.4.5.2.2)

These improvement measures will permit the achievement of an impact magnitude at a high level.

The proposed measures result in a high severity mitigated impact. Thus, the improved impact is of high magnitude.

7.2.4.5.9 Summary

Table 91: Temporary Impact during Construction - Socio-Economic Environment - Local Economy

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Eco-W-Temp-1	Decrease in household incomes due to the potential decrease in the livestock (or even agricultural) activity of the people affected	Adverse	Major	SE-Mit-10	Mitigation- RAP follow-up plan	Medium
				SE-Mit-14	Mitigation- Plan for consultation and support of the communities of the area concerning the development of income-generating activities.	
SE-Eco-W-Temp-2	Increase in local production prices	Positive	Low	SE-Mit-14	Plan for consultation and support of the communities of the area concerning the development of income-generating activities.	High
				SE-Mit-15	Economic support plan for households.	
SE-Eco-W-Temp-3	Increase in local production prices	Adverse	High	SE-Mit-14	Mitigation- Plan for consultation and support of the communities of the area concerning the development of income-generating activities.	Medium
				SE-Mit-15	Mitigation- Economic support plan for households.	
SE-Eco-W-Temp-4	Increase in local development initiatives	Positive	Medium	SE-Mit-14	Plan for consultation and support of the communities of the area concerning the development of income-generating activities.	High
				SE-Mit-15	Economic support plan for households.	
SE-Eco-W-Temp-5	Increase in household incomes	Positive	Medium	SE-7	Communication and hiring management plan	High
SE-Eco-W-Temp-6	Necessary adaptation to the new local economic landscape	Adverse	Low	SE-Mit-14	Mitigation- Plan for consultation and support of the communities of the area concerning the development of income-generating activities.	Negligible
				SE-Mit-15	Mitigation- Economic support plan for households.	

SE-Eco-W-Temp-7	Opportunities for partnerships or cooperative operations	Positive	Medium	SE-Mit-15	Economic support plan for households.	High
SE-Eco-W-Temp-8	Reinforcement of professional skills	Positive	Medium	SE-Mit-7	Communication and hiring management plan	High
				SE-Mit-15	Economic support plan for households.	

7.2.4.6 Impacts on the health and safety of the communities

7.2.4.6.1 Impact SE-Safe-W-Temp-1: Increased risk of accidents due to traffic

Source of the impact: Increase in the movement of equipment and vehicles for the construction area

7.2.4.6.1.1 Impact before mitigation

The construction of the airport infrastructures will induce the use of specific construction equipment and other vehicles in the area. Some of them will travel regularly on the main road, which statistically increases the risk of accidents.

The impacted, very sensitive populations are the village communities in the vicinity but also the people who use the area and potentially their cattle. Special attention is to be paid to children, users of the sides of the road at the exit of the school, who are specifically vulnerable. This peculiarity makes it possible to consider that this impact can be classified as important.

The **impact severity is major**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is high**.

7.2.4.6.1.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Measure SE-Mit-16:
 - Establish a communication plan with the local and surrounding communities of the airport project aimed at emphasizing the potential risks associated with the movement of large equipment and increasing traffic in general.
 - Sensitize livestock breeders to the potential dangers of the proximity of their animals to the main road
 - Organize information meetings at the level of the towns affected by the project
 - Design and construct the structural elements of the project, taking into consideration the risks to workers and affected communities
 - Implement a public awareness campaign for the population on road safety issues in the vicinity of construction sites
- Measure SE-Mit-17:
 - Promote the establishment and use of pedestrian paths along the road and the multiplication of crossways such as pedestrian crossings.
 - Promote communication with local communities concerning road safety guidelines and the importance of their compliance (warning signs, preventive messages, etc.):
 - Design and construct the structural elements of the project, taking into consideration the risks to workers and affected communities

The proposed measures result in a **major severity mitigated impact**. Thus, **the residual impact is of low magnitude**.

7.2.4.6.2 Impact SE-Safe-W-Temp-2: Respiratory discomfort of the inhabitants of the towns closest to the building area

Source of the impact: Possible dust deposits during construction activities

7.2.4.6.2.1 *Impact before mitigation*

Traffic and work in the construction area can produce considerable quantities of dust that is transported by the wind and can reach the surrounding dwellings creating potential respiratory problems.

The inhabitants of the villages closest to the construction area are most susceptible to this potential impact, which is not, according to the people interviewed in the closest village of Plaine Corail, a significant impact.

This low-magnitude adverse impact does not imply the establishment of mitigation measures.

The impact severity is medium. Considering the receptor sensitivity assessed as low, the impact magnitude is low.

7.2.4.6.3 Summary

Table 92: Temporary Impact during Construction - Socio-Economic Environment - Health & Safety of the Community

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Safe-W-Temp-1	Increased risk of accidents due to traffic	Adverse	High	SE-Mit-16	Mitigation - Communication plan for the communities and livestock breeders of the area concerning road safety.	Low
				SE-Mit-17	Mitigation - Facilitation of access to protected pedestrian lanes and safety signage management plan.	
SE-Safe-W-Temp-2	Respiratory discomfort of the inhabitants of the towns closest to the building area	Adverse	Low	None	No mitigation measures to be undertaken	Low

7.2.4.7 Impacts on the health and safety of workers

7.2.4.7.1 Impact SE-Wor-W-Temp-1: Increased risk of accidents and illnesses

Source of the impact: Demanding nature of the construction work

7.2.4.7.1.1 Impact before mitigation

The construction of airport infrastructures implies the necessity of hiring workers for certain difficult, demanding or dangerous tasks which result in an increase in the probability of accidents at work or, in the longer term, work-related illness.

The populations that are receptors of this probable impact are the hired workers from the communities surrounding the project area. The importance of the impact is major and the sensitivity of the receptors can be considered important.

The impact severity is high. Considering the receptor sensitivity assessed as high, the impact magnitude is high.

7.2.4.7.1.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Maintain a connection with the promoters in order to ensure the establishment of appropriate training for workers concerning the potential and specific hazards of their work as well as on the practical actions to be taken to avoid health problems that can occur during their activity during the project. (Measure SE-Mit-18):
- Establish a joint occupational health committee as a framework for consultation with regular meetings (local authorities, communities, airport, Rodrigues government) to address public development initiatives
- Identify all hazards to workplaces, equipment, processes, etc. and assess the risks of accidents occurring for each hazard, in order to prioritize them and set priorities for prevention and to ensure that the infrastructure of the project in order to limit untimely penetrations that could generate accidents
- Establish a system of protection of workers against occupational diseases (screening of nuisance factors, regular medical visits of workers, etc.)
- Establish a project worker training program to ensure that these employees have the skills, information and capabilities to manage the risks associated with the position to which they are assigned
- The goal of this plan is to initiate measures to prevent accidents, injuries and illnesses resulting from work by minimizing the causes of these hazards as much as possible
- Equip workers with all the necessary protective equipment to minimize the risks associated with the tasks carried out in the course of their employment
- Develop and implement a workforce management plan that includes the provision of a safe and healthy working environment
- Report any accident, incident or professional disease
- Conduct a medical follow-up of the all workers and a more specific follow-up for the workers exposed to specific nuisances and dangers (noise, dust, vibrations)
- Prepare a training program for employees and a training plan for communities in collaboration with regional administrative authorities
- Ensure that employees are continuously trained on the following subjects:
 - training in relation to the performance of work specific to each position
 - specific training for each task for any new assignment
 - knowledge of the risks associated with the work and the current health and safety procedures

- understanding of the appropriate procedures associated with the use and handling of hazardous materials
- knowledge of hiring conditions and personnel rights
- knowledge of emergency procedures and training related to this topic
- knowledge of the workers' code of conduct (internal rules of the base camp)
- Promote communication with local communities on the importance of complying with the safety instructions given by the contractors for the new airport infrastructures. (Measure SE-Mit-19):
- Organize information meetings at the level of the towns affected by the project
- Ensure the infrastructure of the project in order to limit untimely penetrations that could generate accidents
- The goal of this plan is to initiate measures to prevent accidents, injuries and illnesses resulting from work by minimizing the causes of these hazards as much as possible
- Develop the health/safety culture of project workers and raise awareness of risks and their mastery
- Prepare a training program for employees and a training plan for communities in collaboration with regional administrative authorities
- Ensure that employees are continuously trained on the following subjects:
- Training in relation to the performance of work specific to each position
- specific training for each task for any new assignment
- knowledge of the risks associated with the work and the current health and safety procedures
- understanding of the appropriate procedures associated with the use and handling of hazardous materials
- knowledge of hiring conditions and personnel rights
- knowledge of emergency procedures and training related to this topic
- knowledge of the workers' code of conduct
- Train employees as soon as they are admitted to the project and on an ongoing basis over the life of the project concerning safety risk issues and the procedures applicable to project employees

These mitigation measures will permit the limitation of the magnitude of the impact to a medium level as risks still exist for such works projects.

The proposed measures result in a high severity mitigated impact. Thus, the residual impact is of medium magnitude.

7.2.4.7.2 Summary

Table 93: Temporary Impact during Construction - Socio-Economic Environment - Health & Safety of Workers

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Wor-W-Temp-1	Increased risk of accidents and illnesses	Negative	High	SE-Mit-18	Mitigation - Coordination with the contractors involved in the work sites for the implementation of specific Health-Safety training.	Medium
				SE-Mit-19	Mitigation - Communication plan for the communities concerning the importance of complying with safety instructions on construction sites	

7.2.5 Air quality and noise

7.2.5.1 Air quality

7.2.5.1.1 Impact Air-W-Temp-1: Alteration of air quality due to construction activities

7.2.5.1.1.1 Impact before mitigation

During construction phase, dust and pollutants emissions could affect air quality in the area around the work.

As the project is only at the Preliminary Design stage, the construction phase is not yet precisely described, only some principles are known.

The operations that might generate pollutions are earthworks, infrastructures construction and the demolition of Sainte-Marie Hill. Also, the supplies for the construction site will be transported by road, which will cause polluting emissions due to the increase in road traffic, in particular with heavy goods vehicles.

Sensitivity to dust and air pollution in the area is high, since several households are located at less than 1000m from the work area. Ambient air quality will be affected in a non-quantifiable proportion at this stage; however the foreseeable effects relate to the increase of air pollutants such as CO, HC, NO_x, and particulate matter, dust fallout and less visibility in the immediate environment of the work.

As these effects will be of limited duration, the impact severity is assessed to be medium.

The impact severity is medium. Considering the receptor sensitivity assessed as high, the impact magnitude is medium.

7.2.5.1.1.2 Mitigation measure and impact after mitigation

A set of various mitigation measures are to be considered:

- Institute a speed limit on all unpaved roads around the site (max 30 km/h)
- Regularly water the main roads and areas producing dust
- Limit the storage and handling of materials that may create dust
- Reduce road traffic to a minimum by optimizing the truck loading for the site supply
- Minimize on-site travel distances and avoid traffic close to inhabited areas as much as possible

With mitigation measures, the impact severity is assessed to be low.

The proposed measures result in a medium severity mitigated impact. Thus, The residual impact is of low magnitude.

7.2.5.1.2 Summary

Table 94: Temporary Impact during Construction - Air Quality

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Air-W-Temp-1	Alteration of air quality due to construction activities	Adverse	Medium	Air-Mit-1	Institute a speed limit on all unpaved roads around the site (max 30 km/h)	Low
				Air-Mit-2	Regularly water the main roads and areas producing dust	
				Air-Mit-3	Limit the storage and handling of materials that may create dust	
				Air-Mit-4	Reduce road traffic to a minimum by optimizing the truck loading for the site supply	
				Air-Mit-5	Minimize on-site travel distances and avoid as far as possible traffic close to inhabited areas	

7.2.5.2 Noise

7.2.5.2.1 Impact Noi-W-Temp-1: nuisance caused by noise due du construction activities

7.2.5.2.1.1 Impact before mitigation

As the project is only at the Preliminary Design stage, the construction phase is not yet precisely described, only some principles are known.

The operations that might generate noise are earthworks, infrastructure construction and the demolition of Sainte-Marie Hill. Also, the supplies for the construction site will be transported by road, which will cause noise emissions due to the increase in road traffic, in particular with heavy goods vehicles.

As residential areas are very close to the work area (less than 200m), sensitivity to noise is high. Construction activities such as excavations, earthworks and movements of large vehicles, will cause noise in a non-quantifiable proportion at this stage, and disturb the neighbours, especially because the background noise is low. However, these nuisances will be limited in time and will not affect populations in the long term.

As these effects will be of limited duration, the impact severity is assessed to be low.

The resultant impact magnitude is therefore low.

Thus, the impact severity is low. Considering the receptor sensitivity assessed as high, **the impact magnitude is low.**

7.2.5.2.1.2 Mitigation measure and impact after mitigation

Since the disturbance is greatest at night, the key mitigation measure is to limit or even eliminate all night work, and if possible to avoid work during the period 18.00 – 22.00 hrs.

The choice of the least noisy techniques and equipment can also help to reduce the acoustic impact of the worksite.

The proposed measures result in a low severity mitigated impact. Thus, **The residual impact is of low magnitude.**

7.2.5.2.2 Summary

Table 95: Temporary Impact during Construction - Socio-Economic Environment - Noise

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Noi-W-Temp-1	Nuisance caused by noise due du construction activities	Adverse	Low	Noi-Mit-1	Avoid night work and limit work during evening period	Low
				Noi-Mit-2	Choose the least noisy techniques and equipments	Low

7.2.6 Heritage resources and visual environment

7.2.6.1 Paleontology

None.

7.2.6.2 Landscape and visual environment

Landscape and visual resources are defined as the combination of the following components that are part of the landscape and give visual, aesthetic or scenic quality to the environment: topography, geology, forests, open spaces, biodiversity, relief, rivers and coastlines.

Visual and landscape impacts can occur when new elements are introduced into a landscape, or when existing elements are modified or removed, leading to a change in the way stakeholders access, perceive or use landscape resources.

In each case, the impact can be perceived as adverse or positive, depending on the nature and degree of the change and people's attitudes towards the current and new landscape. These impacts can be assessed by referring to changes in the landscape as perceived from perspectives from which individuals or groups of individuals see the project.

7.2.6.2.1 Impact Vis-W-Temp-1: alteration of the living environment

7.2.6.2.1.1 Impact before mitigation

Sources of temporary impact associated with the construction phase may include:

- Road and track construction;
- Vegetation clearance;
- The movement of large construction vehicles;
- Construction and operation of the crushers, conveyors and processing plant;
- Temporary earthworks.

Plaine Corail and existing buildings have moderately valued characteristics. Local landscape thus is reasonably tolerant to changes.

Sensitivity to alteration of the living environment in the area can be considered as Medium.

Impacts listed before are likely to occur with an absolute certainty.

The impact severity is medium. Considering the receptor sensitivity assessed as medium, the impact magnitude is medium.

7.2.6.2.1.2 Mitigation measure and impact after mitigation

A series of mitigation measures will help to minimize the landscape and visual impacts of construction activities. These measures will be designed to:

- Limit the vegetation clearing area during construction to the minimum necessary to carry construction works;
- Prevent encroachment of areas outside designated boundaries to avoid damaging landscape resources;
- Minimize visual intrusion through the sensitive design of structures and buildings, including the choice of implantation, size and colours for key buildings. Colour finishes for site buildings will be limited to browns, ochres and greens. White, light colours and primary colours shall be avoided as much as possible;

- Minimize of construction sites necessary for safety and security, and minimize scattered light outside the immediate work area, particularly towards the sky at night;
- Ensure that platforms and construction work areas are maintained in a clean and orderly manner through adequate maintenance;
- Perform temporary seeding during all construction stage to avoid dust or soil washout, but help weed control and pest control;
- Temporary fences and earthworks will be arranged to reduce visual intrusion on neighbouring homes;
- Ensure that earth and material storage areas are not located directly on the coast, are not likely to be dragged into a river or sea, and are located taking into account the surrounding landscape;
- Plantings (trees and bushes) are designed and arranged to form visual screens to mitigate visual impacts from nearby roads and homes:
- Early planting needed for efficient screening when construction works starts;
- Screen planting does contribute to construction acceptance and generally speaking planting contributes to a positive perception of the construction phase; Screen planting is described in 7.4.6.2.
- Rehabilitate areas that were temporarily used during construction as soon as possible after completion of the work.

These mitigation measures will permit the limitation of the magnitude of the impact to a low level.

There is a risk on living environment of considering visual and aesthetic measures as secondary or unnecessary.

The proposed measures result in a medium severity mitigated impact. Thus, The residual impact is of low magnitude.

7.2.6.2.2 Impact Vis-W-Temp-2: increasing pressure on island landscape

7.2.6.2.2.1 Impact before mitigation

Sources of temporary indirect impacts associated with the construction phase may include:

- The simultaneous construction of residential buildings to relocate 30 families;
- Changes in land use as a result of the relocation of associated farms.

Population shift might be reflected in dispersed building or new community settlement. It has been monitored and associated into existing settlements. Therefore, impact on landscape is not yet to come. Natural environment and landscape are not considered to have been degraded and modified.

General sensitivity to pressure increase on island landscape can therefore be considered as not significant.

Alteration to key elements of the landscape character, might result in noticeable to partial change of character.

The impact severity is not significant. Considering receptor sensitivity assessed as medium, the impact magnitude is negligible.



7.2.6.2.2.2 *Mitigation measure and impact after mitigation*

Three mitigation measures will help to minimize the landscape and visual impacts of construction activities:

- Favor dispersed relocation building in existing communities;
- Relocate families outside of the Zone of Visual Influence;
- Community support in construction process.

These mitigation measures will permit the limitation of the magnitude of the impact to a medium level.

The proposed measures result in a not significant impact. Thus, The residual impact is of **negligible magnitude**.

7.2.6.2.3 Summary

Table 96: Temporary Impact during Construction - Landscape & Visual Environment

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Impact Vis-W-Temp-1	Alteration of the living environment	Adverse	Medium	Land-Mit-1	Limit the vegetation clearing area during construction;	Low
				Land-Mit-2	Prevent encroachment of areas outside designated boundaries to avoid damaging landscape resources;	
				Land-Mit-3	Minimize the lighting of construction sites	
				Land-Mit-4	Minimize visual intrusion	
				Land-Mit-5	Ensure that platforms and construction work areas are maintained in a clean and orderly manner	
				Land-Mit-6	Perform temporary seeding	
				Land-Mit-7	Temporary fences and earthworks will be arranged to reduce visual intrusion;	
				Land-Mit-8	Ensure that earth and material storage areas are not located directly on the coast;	
				Land-Mit-9	Plantings are designed and arranged to form visual screens to mitigate visual impacts;	
				Land-Mit-10	Rehabilitate areas that were temporarily used during construction.	
Impact Vis-W-Temp-2	Increasing pressure on island landscape	Adverse	Negligible	Land-Mit-11	Favor dispersed relocation building in existing communities;	Negligible
				Land-Mit-12	Relocate families outside of the Zone of Visual Influence;	
				Land-Mit-13	Community support in construction process	

7.3 Permanent and irreversible impacts during Construction Phase

7.3.1 Physical environment

7.3.1.1 Marine physical environment: shores, currents, turbidity and sedimentation

The main permanent impacts due to the construction on the marine physical environment are the:

- Modification of the local bathymetry and the shoreline;
- Modification of the hydrodynamic processes;
- Modification of the sediment transit;
- Modification of the bathymetry due to the dredging to access jetty facilities;
- Remains of suspended particulate matter and sediment.

7.3.1.1.1 Impact Phy-Mar-W-Def-1

7.3.1.1.1.1 Impact before mitigation

The action of changing the coastline and adding aggregate might alter the topography from which it existed previously.

The shoreline is modified by the extensions at 4 locations which represents more than 900m of new coastline, due to the extension of the runway and the vicinity of the jetty facilities. The constitution of the coastline is now partly artificial instead of being mainly composed of rock (see image below) interspersed with a few sandy beaches.



Figure 175: rocky coast in the west backfilled area

The impact severity is low. Considering the receptor sensitivity assessed as medium, **the impact magnitude is low.**

7.3.1.1.1.2 Mitigation measure and impact after mitigation

As the impact magnitude is low, no mitigation measure is necessary.

7.3.1.1.2 Impact Phy-Mar-W-Def-2

7.3.1.1.2.1 Impact before mitigation

Newly built areas will change the coastline geometry and seabed morphology leading to cause significant changes to the coastal hydrodynamics; it may redistribute wave energy, cause changes in wave propagation and change tidal current speed and direction especially in the channel between Crab Island and the mainland where the width is limited.

However, the dimensions of the constructed area are so secondary that the impact severity is low at Rodrigues's scale. Wave pattern does not experience significant changes, wave heights are restricted by the lagoon's restraining action, breaking on the reef barrier.

In Plaine Corail, flow magnitudes are higher, beyond 0.10 m/s behind the the construction. Flow locally changes direction to circumvent the new runway delineation, and resume its trajectory, see table below.

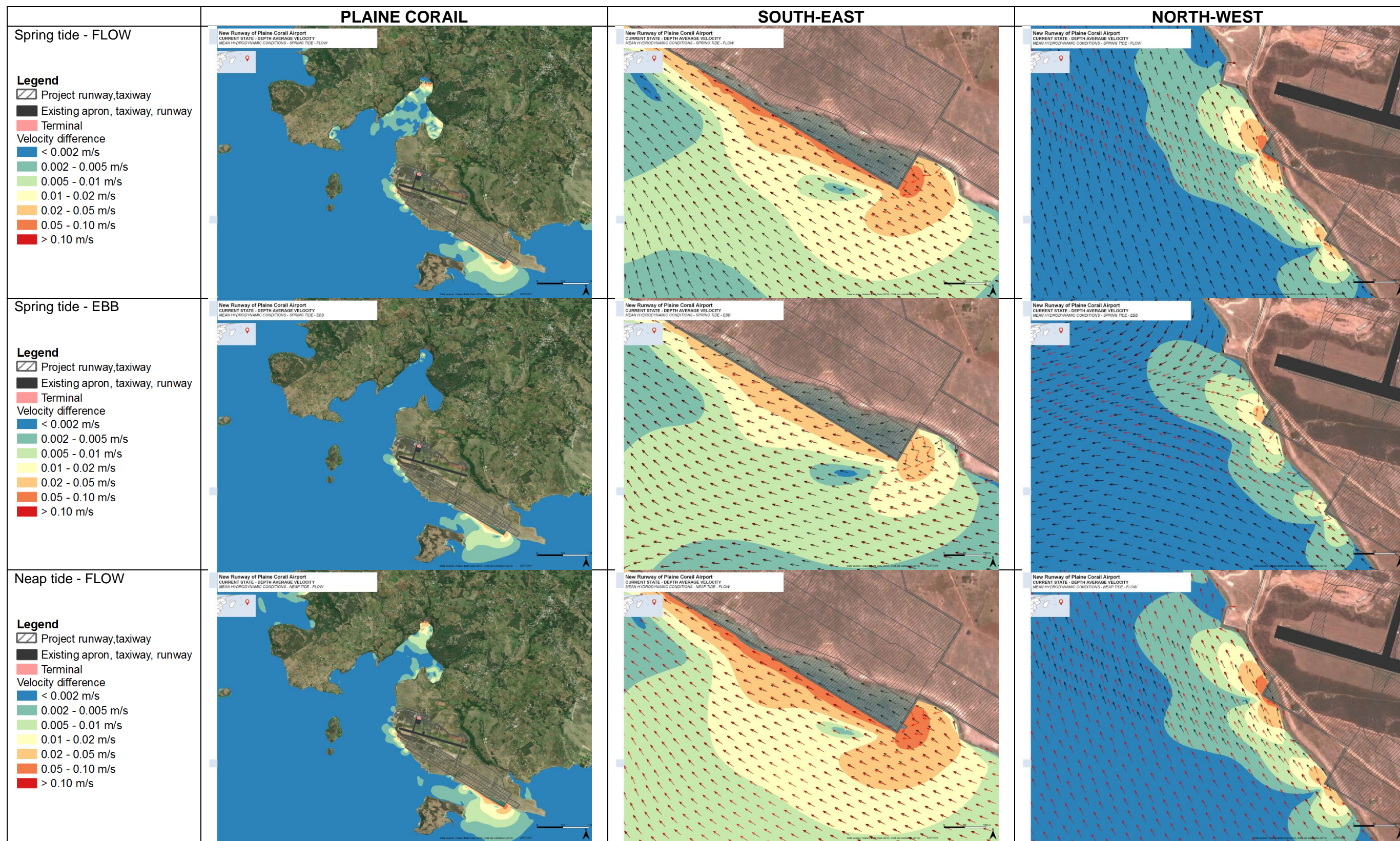
The main receptor affected by this action may be the physical coastal processes.

The impact severity is not significant. Considering the receptor sensitivity assessed as medium, the impact magnitude is negligible.

7.3.1.1.2.2 Mitigation measure and impact after mitigation

As the impact magnitude is negligible, no mitigation measure is necessary.

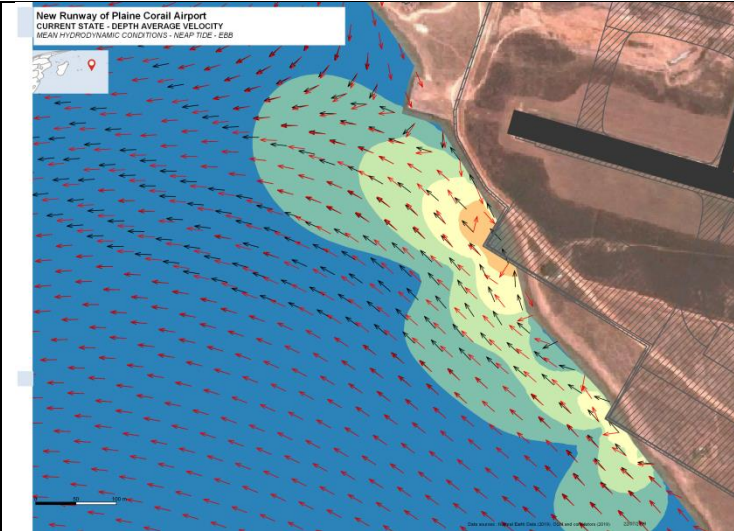
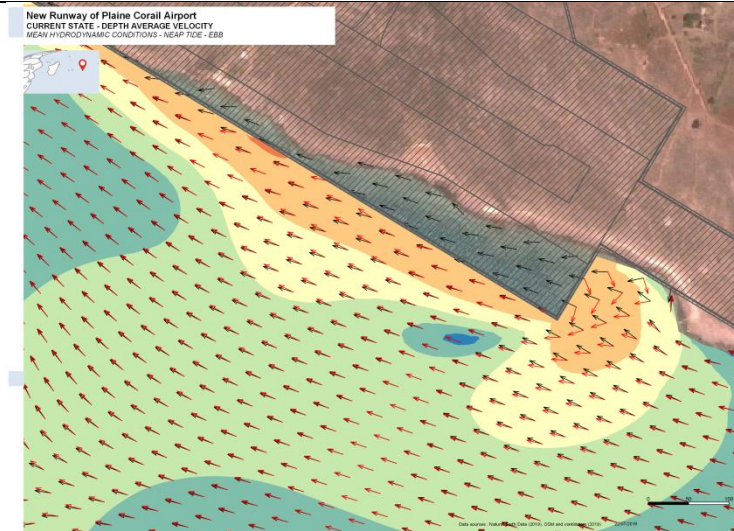
Table 97: Differential of circulation due to the constructed runway



Neap tide - EBB

Legend

- Project runway, taxiway
- Existing apron, taxiway, runway
- Terminal
- Velocity difference
- < 0.002 m/s
- 0.002 - 0.005 m/s
- 0.005 - 0.01 m/s
- 0.01 - 0.02 m/s
- 0.02 - 0.05 m/s
- 0.05 - 0.10 m/s
- > 0.10 m/s



7.3.1.1.3 Impact Phy-Mar-W-Def-3

7.3.1.1.3.1 Impact before mitigation

The extension of the airport will change the coastline geometry, seabed morphology and flow pattern leading to changes in sediment balance, transport and deposition regime.

Areas exposed to current and wave action are different from before the construction. The sedimentary composition of the seabed has changed: new sediments are available in the vicinity of the discharge and sediment that used to be on the area reclaimed from the sea has been replaced by artificial structure, non-erodible.

A numerical sediment transport model is constructed and exploited to identify deposit/erosion areas and sediment movement pattern in general. The model is forced by mean annual meteorological conditions, summarized in the table below, during a hydrodynamic period of 14.5 days (1 neap tide + 1 spring tide). As morphological changes take place over much longer periods than short-term hydrodynamics, a morphological acceleration factor is used in the model enabling a 3 months evolution simulation. A simulation is conducted with the runway extension achieved, another one in the current state.

Table 98: Marine sediment model inputs

Sediment transport model input (DELFT-3D)			
Winds conditions	Waves conditions		Roughness
V = 8.5 m/s Dir = 105°	Hs = 2.25m Tp = 14.5s Dir = 215°	Hs = 2.75m Tp = 9.25s Dir = 105°	Specific density = 2650 kg/m ³ Dry bed density = 1600 kg/m ³ C = 40 m ^{1/2} /s in the lagoon C = 65 m ^{1/2} /s elsewhere

A movable sediment bed of 0.3m in thickness was assumed to exist everywhere from the seaward of the reef to the coast. Two types of sediments are used in the model, the grain size (750µm and 380µm) and special distribution is retrieved from analysis of the sample collected in the surroundings of Plaine Corail.

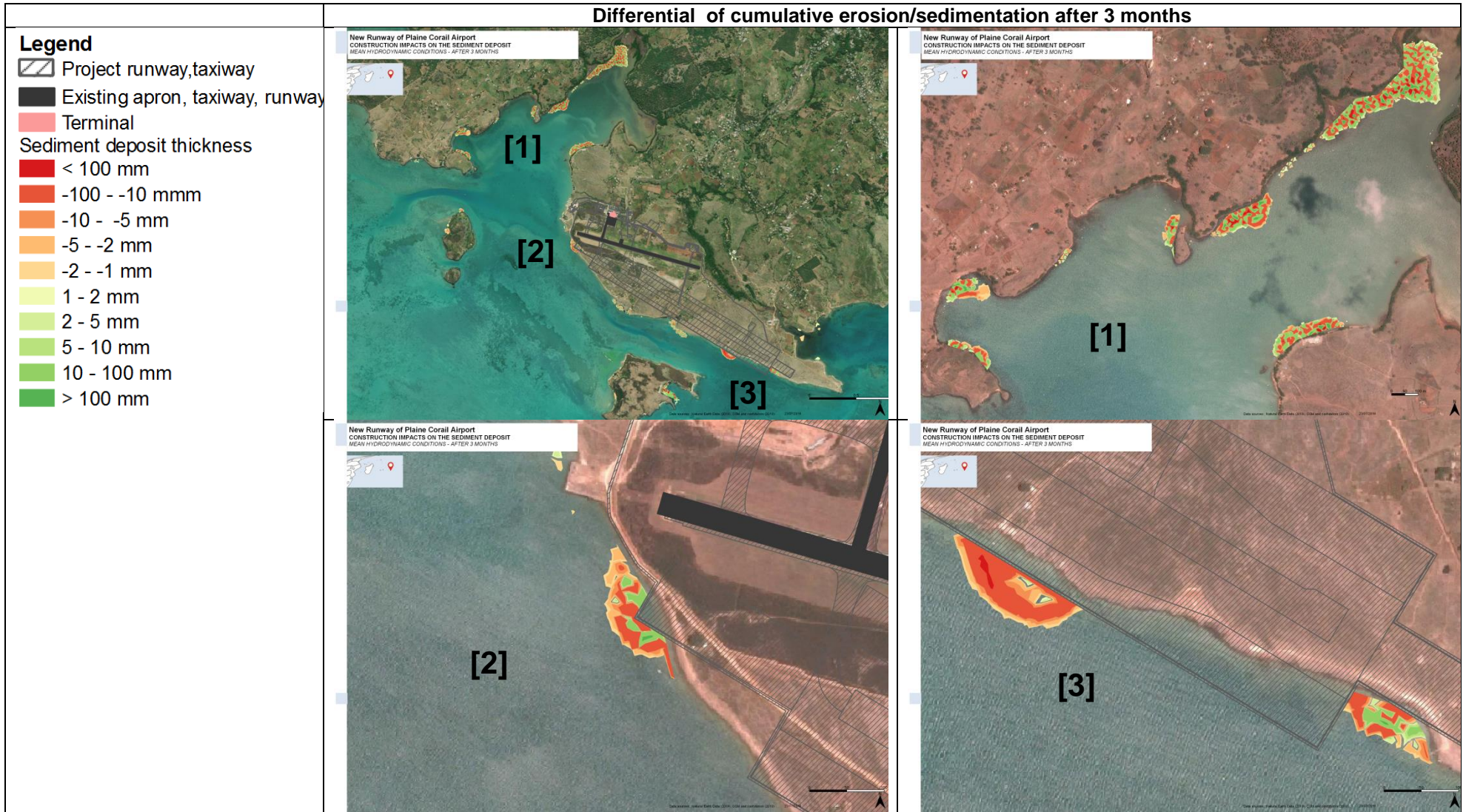
Outcomes are qualitative. The sediment accumulation/deposit result assessment will be analyzed to define whether or not the construction stage of the project will affect sensitive areas.

Three months after the constructions are achieved, two areas will be impacted:

- The shoreline of Topaze bay. However, values are so small that it may be residual numerical errors;
- The newly build area reclaimed from the sea and its immediate surroundings.

The general sediment flux has not been affected.

Table 99: Impact on sediment deposit due to the construction of the Runway



The main receptor affected by this action may be the marine sediment dynamic.

The impact severity is low. Considering the receptor sensitivity assessed as medium, the impact magnitude is low.

7.3.1.1.3.2 Mitigation measure and impact after mitigation

As the impact magnitude is negligible, no mitigation measure is necessary.

7.3.1.1.4 Impact Phy-Mar-W-Def-4

7.3.1.1.4.1 Impact before mitigation

The potential new dredge channel to access the jetty facilities and the boathouse changes the bathymetry of the area leading to modification in the sediment balance, transport and deposition regime.

The area is located away from main currents and thus from sediment transport. Impacts on those parameters are very small.

The impact severity is low. Considering the receptor sensitivity assessed as medium, the impact magnitude is low.

7.3.1.1.4.2 Mitigation measure and impact after mitigation

As the impact magnitude is low, no mitigation measure is necessary.

7.3.1.1.5 Impact Phy-Mar-W-Def-5

7.3.1.1.5.1 Impact before mitigation

The land reclaimed by the ocean construction process and dredging near the jetty facilities generates a turbid flume and releases an important amount of suspended matter. Once the work is done, part of it still remains. It has not settled down to the seabed and has not been flown away with the ebb/flow currents.

Depending on the concentration of sediment released, remaining particles can stay for a long period but the turbidity will naturally decrease with time.

The main receptor affected by this action may be the marine sediment quality.

The impact severity is low. Considering the receptor sensitivity assessed as medium, the impact magnitude is low.

7.3.1.1.5.2 Mitigation measure and impact after mitigation

As the impact magnitude is low, no mitigation measure is necessary.

7.3.1.1.6 Summary

Table 100: Permanent Impact during Constructon - Physical Environment - Marine

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Phy-Mar-W-Def-1	Alteration of the local bathymetry and shoreline	Adverse	Low	None	-	Low
Phy-Mar-W-Def-2	Modification of the local hydrodynamic processes	Adverse	Negligible	None	-	Negligible
Phy-Mar-W-Def-3	- Modification of the sediment transit	Adverse	Low	None	-	Low
Phy-Mar-W-Def-4	- Modification of the bathymetry due to the dredging to access jetty facilities	Adverse	Low	None	-	Low
Phy-Mar-W-Def-5	- Remains of suspended particulate matter and sediment	Adverse	Low	None	-	Low

7.3.1.2 Hydrology

7.3.1.2.1 Impact Phy-Hyd-W-Def-1: Transfer of sediments to the lagoon

7.3.1.2.1.1 Impact before mitigation

Excavation and remodeling of the natural terrain will facilitate soil erosion in the event of a heavy rainfall during the construction phase, increasing the supply of materials to the lagoon and destabilizing the ecosystem.

The impact severity is high. Considering the receptor sensitivity assessed as major, the impact magnitude is major.

7.3.1.2.1.2 Mitigation measure and impact after mitigation

The aim of the proposed mitigation measures is to avoid erosion during the works. Temporary sedimentation ponds downstream of the construction sites will be implemented. These ponds may be made of materials available on site; particular attention must be paid to the stability of the structures thus created.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of low magnitude.

7.3.1.2.2 Summary

Table 101: Permanent Impact during Constructon - Physical Environment - Hydrology

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Phy-Hyd-W-Def-1	Transfer of sediments to the lagoon	Adverse	Major	Phy-Hyd-Mit-1	Temporary sedimentation ponds	Low

7.3.1.3 Geotechnics and Hydrogeology

Chapter 7.2.1.3.1 Earthworks in the new proposed runway area refers.

7.3.1.3.1 Impact Phy-Kar-W-Def-1: Caverns collapse

7.3.1.3.1.1 Impact before mitigation

The works that could threaten the known caverns (Cabris, Gastonia and Grotte Fougère) closest to the new infrastructure during construction would be the collapse of the cavities from the passage of heavy vehicles or by backfilling with alternative materials. This would make access to the karst network difficult.

The impact severity is medium. Considering the receptor sensitivity assessed as medium, the impact magnitude is medium.

7.3.1.3.1.2 Mitigation measure and impact after mitigation

Different mitigation measures can be used to limit and or avoid the impact of heavy vehicles such as the definition of a restricted area around the caverns (restricted area to be defined taking into account each particular specificity of the caverns) where no heavy vehicle will be allowed to access. In addition, speed of trucks' movement can be reduced to an acceptable level in order to minimize the induced vibrations, susceptible to collapse caverns. If not able to avoid going close to the restricted area, trucks' movements and rotations can be adapted to reduce rotations between the embankment filling site and the material storage site.

Note that these mitigation measures only need to be planned for the extreme southeastern part of the project, where the three mentioned caverns are located.

The proposed measures result in a medium severity mitigated impact. Thus, The residual impact is of low magnitude.

7.3.1.3.2 Impact Phy-Kar-W-Def-2: Damage to caves

7.3.1.3.2.1 Impact before mitigation

Permanent closure of access to karst cavities would not allow future studies to be carried out in the sediments of the Caverne Fougère or others not yet explored.

The impact severity is medium. Considering the receptor sensitivity assessed as medium, the impact magnitude is medium.

7.3.1.3.2.2 Mitigation measure and impact after mitigation

Caverns entries need to be secured, for example, by installing a fence around the entrance openings. Some specialists in karst and environmental paleontology have strongly recommended that the sedimentary content of Grotte Fougère, and potentially other ones, be removed before construction work is carried out. It would also be important to better map the extension of the karst network, mainly in the eastern part of Plaine Corail, before construction begins. This would give specialists the opportunity to record or move all relevant scientific and environmental information before any disturbances or losses occur.

The proposed measures result in a low severity mitigated impact. Thus, **The residual impact is of low magnitude.**

7.3.1.3.3 Impact Phy-Kar-W-Def-3: Groundwater flow disturbances

7.3.1.3.3.1 Impact before mitigation

The nature of the impacts on the groundwater flow will focus mainly on changing surface coverage. Indeed, the excavation of the topsoil and the removal of geological material, such as basalt from Mont Sainte-Marie, will change the vertical recharge regime and thus the groundwater flow regime. Replacing these natural materials with an impermeable cover, as it is the case with the airstrip and its drainage system, will reduce recharge and therefore, depending on the contribution of this component to the total recharge of aquifers, will decrease the volume of groundwater in the Coral Plain. The hydraulic gradient and direction of groundwater flow may therefore be subject to local changes. However, it is not possible at this stage of knowledge to quantify the impact on groundwater flow.

The **impact severity is medium.** Considering the **receptor sensitivity assessed as high,** **the impact magnitude is low.**

7.3.1.3.3.2 Mitigation measure and impact after mitigation

There are no possible mitigation measures during the works because the groundwater regime is locally linked to the recharge rate, which is mainly associated with precipitation, soil type and topography. Where the nature of the soil and topography change, the recharge rate will inevitably change.

The proposed measures result in a **medium severity mitigated impact.** Thus, **The residual impact is of low magnitude.**

7.3.1.3.4 Impact Phy-Kar-W-Def-4: Pollution of groundwater

7.3.1.3.4.1 Impact before mitigation

The flow of any foreign liquid on the ground and indirectly into aquifers through the unsaturated part will modify groundwater quality in the more or less long term depending on the percolation rate and underground transport process. The water quality of the only water catchment structure (Caverne Bouteille) is therefore threatened in quantity and quality during the construction phase. Refer to section 7.3.1.4.2 for groundwater resource impact.

Groundwater contamination can therefore be considered permanent following the construction phase since unsaturated cavities in the karst network can contain this contamination for a very long time.

The **impact severity is high.** Considering the **receptor sensitivity assessed as high,** **the impact magnitude is high.**

7.3.1.3.4.2 Mitigation measure and impact after mitigation

The mitigation of a contamination event consists mainly in the implementation of preventive measures to reduce risks during the construction phase.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of **negligible magnitude**.

7.3.1.3.5 Impact Phy-Kar-W-Def-5: Cut and fill balance impacts

The cut and fill balance should lead, if all the cuttings can be reused as expected, to a excedent of materials. However, it can't be certain yet that the cuttings will be able to be reused and there might need to import material for filling.

This section addresses the impact of material import and cuttings management. However, as it is not known yet how much could be reused, impacts nor measures aren't quantified.

7.3.1.3.5.1 Impact before mitigation

The potential impacts of infill material import are the followings are associated to the material extraction on the quarries site: Mount Topaze and Mount Coupier were targeted as potential source of material in the case of not reusable cuttings. The contractor could also choose to bring material from outside of the island.

The permanent potential impacts of material impact are:

- on the extraction site: biodiversity destruction, water flows disturbance, slopes modification and associated risks, on site pollution (extraction works), landscape impacts,
- on the works area: import of pollutants or alien invasive species seeds risk.

The potential impacts of the cuttings excess management are associated to the final storage place environment: biodiversity destruction, water flows disturbance, slopes modification and associated risks, on site pollution (extraction works), landscape impacts, import of pollutants or alien invasive species seeds risk.

The impact magnitude can't be assessed as the receptor isn't known.

7.3.1.3.5.2 Mitigation measure and impact after mitigation

In case of import material need, the international environmental standards and recommendations compliance should be checked prior to the extraction site and methods choice. An impact assessment would have to be presented by the contractor and the extraction site will have to be approved by the client.

In case of cuttings to manage, it will be forbidden to export the material out of the airport area. All treatment and reuse possibilities will have to be explored: in backfill is not possible, use in the concrete fabrication process will have to be studied. If no reuse were possible, storage in landscaping hills would have to be done.

The proposed measures result in a **low mitigated impact**.

7.3.1.3.6 Summary

Table 102: Permanent Impact during Construction - Physical Environment - Karstic Environment

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Phy-Kar-W-Def-1	Caverns collapse	Adverse	Medium	Phy-Kar-Mit/Av-12	Define a restricted area around the caverns with no heavy vehicles allowed to access	Low
				Phy-Kar-Mit-13	Reduce trucks' movement's speed to an acceptable level for minimizing the induced vibrations	
				Phy-Kar-Av-14	Adapt and reduce trucks' movements and rotations between the embankment filling site and material storage site	
Phy-Kar-W-Def-2	Damages to caves	Adverse	Medium	Phy-Kar-Av-15	Restrict traffic in close vicinity of the caves	Low
				Phy-Kar-Av-16	restrict access to airport to necessary construction and operations staff	
				Phy-Kar-Comp-17	Remove the remaining fossiliferous sediments from all threatened caves	
Phy-Kar-W-Def-3	Groundwater flow disturbances	Adverse	High	Phy-Wat-Comp-5	Relocation of the intake of Caverne Bouteille (replacement by seawater).	Low
Phy-Kar-W-Def-4	Pollution of groundwater	Adverse	Medium	Phy-Kar-Av/Mit-18	Daily maintenance and inspection of excavators	Low
				Phy-Kar-Av/Mit-19	No maintenance and refuelling on the construction site (or with specific waterproof delimited zone)	
				Phy-Kar-Mit-20	Establishment of a storage site for earthworks wastes (wood from formwork, material and equipment wrappings, unusable cement / grouting mixes, damaged or contaminated construction material), close to the project site, in order to reduce pollution induced by traffic from storage activity	

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
				Phy-Wat-Comp-5	Relocation of the intake of Caverne Bouteille (replacement by seawater).	
Phy-Kar-W-Def-5	Cut and fills balance impacts on extraction and storage sites	Adverse	Unknown	Phy-Kar-Mit-21	Proceed to an impact assessment of the extraction site and have the material origin validate priori the works phase	Low
				Phy-Kar-Mit-11	Chose the closest extraction site for fill material / Forbid the export of cuttings	

7.3.1.4 Water resource and waste water management

7.3.1.4.1 Impact Phy-Wat-W-Def-1: Demolition of Bangelique reservoir

7.3.1.4.1.1 Impact before mitigation

The reservoir of Bangélique is located within the project footprint, close to Sainte Marie Hill. It's to be demolished by the project. However, this tank is not used anymore.

The impact severity is low. Considering the receptor sensitivity assessed as low, **the impact magnitude is low**.

7.3.1.4.1.2 Mitigation measure and impact after mitigation

No measure is proposed as the tank is not used anymore.

The residual impact is of

7.3.1.4.2 Impact Phy-Wat-W-Def-2: impact of works on water resource supply

7.3.1.4.2.1 Impact before mitigation

The temporary impacts on the groundwater resource presented in section 6.2.1.4 (increased groundwater turbidity and impact on the pumping system and on the reverse osmosis process) may become permanent if they are not controlled and corrected in time.

Furthermore, the groundwater flow disturbance could result in a decrease of Caverne bouteille flow alimentation.

The **impact severity is high**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is high**.

7.3.1.4.2.2 Mitigation measure and impact after mitigation

Risk prevention measures and an action plan in the event of an accident are the best means of minimizing the risk of contamination and controlling and cleaning up the receiving environment. (Phy-Wat-Av/Mit-4)

After the construction works, the supply of seawater (or relocated intake) to the upgraded Caverne Bouteille plant must be maintained, long enough to carry out measurements and analysis on Caverne Bouteille underground water intake.

In case of a decrease of Caverne Bouteille's supply by underground water, or persistent impact on the pumping or desalination system, the temporary solution (relocation or supply by seawater pumping) should become definitive. (Phy-Wat-Comp-5)

The proposed measures result in a low severity mitigated impact. Thus, **The residual impact is of low magnitude**.

7.3.1.4.3 Summary

Table 103: Permanent Impact during Construction - Physical Environment - Water & Wastewater

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Phy-Wat-W-Def-1	Demolition of Bangelic reservoir	Adverse	Low	-	-	Low
Phy-Wat-W-Def-2	Impact on Caverne Bouteille's supply	Adverse	High	Phy-Wat-Comp-5	Carry out measurements on Caverne Bouteille intake Go on supplying inhabitants from water supply during analyzis and measurements According to measurements results, keep using seawater in a definitive manner or get back to the initial situation, pumping underground water in Caverne Bouteille intake	Low
				Phy-Wat-Av/Mit-4	Preventive measures to reduce risks during the construction phase - Risk management plan	

7.3.2 Biological environment

The relocation of the control tower and fire station shall be considered at detailed design stage. Taking into account response time for the rescue and fire fighting services and visibility of the control tower.

Human impacts on terrestrial biodiversity have escalated with the spread and development of agriculture, resulting in the replacement of forest and other natural habitats by simpler ecosystems of much higher human carrying capacity. These types of developments have had a cumulative impact on biodiversity and resulted in effects such as habitat loss and fragmentation, pollution (both chemical and biotic) and disturbance such as light, noise and pet predation.

The main effects of the proposed airstrip extension will be:

- Loss of semi-natural vegetation and some ecosystem functions.
- Loss of native gasteropoda individuals and their foraging habitat. These aspects are discussed in more detail below.
- Loss of native trees of a low, medium, high and major sensitivity for Rodrigues Island.

7.3.2.1 Terrestrial habitat

It is likely that the overall area of semi-natural habitats (grazing lawns, thickets and shrubs) within the project footprint contributes to the ecological corridor of the Anse Quitor nature reserve, for instance, as a corridor and feeding site for arthropods, bats and birds (*Numenius phaeopus*). At least, 84 hectares of grazing lands, Lantana's and Leucaena's thickets, or coastal vegetation will be destroyed, which represents more than a third of the total surface area of influence.

The overall impact magnitude on habitat loss is assessed at low. The impacts for each type of habitat are detailed below.

7.3.2.1.1 Impact BioT-Hab-W-Def-1: Impact on Grazing lands on basaltic resurgences

7.3.2.1.1.1 Impact before mitigation

The different areas which are concerned by the project are detailed in the table below.

Items	Area/number of specimens inside the area of influence (ha)	Area/number of specimens inside the project footprint (ha)
Grazing lands on basaltic resurgences	4,55	0,16

The impact is the loss of semi-natural vegetation and some ecosystem functions.

The impact severity is low. Considering the receptor sensitivity assessed as medium, **the impact magnitude is low.**

7.3.2.1.1.2 Mitigation measure and impact after mitigation

No measure is recommended.

The proposed measures result in a low severity mitigated impact. Thus, **The residual impact is of low magnitude.**

7.3.2.1.2 Impact BioT-Hab-W-Def-2: Impact on Grazing lands on calcarenic substratum

7.3.2.1.2.1 Impact before mitigation

The different areas which are concerned by the project are detailed in the table below.

Items	Area/number of specimens inside the area of influence (ha)	Area/number of specimens inside the project footprint (ha)
Grazing lands on calcarenic substratum	66,61	39,86

The impact is the loss of semi-natural vegetation and some ecosystem functions.

The impact severity is medium. Considering the receptor sensitivity assessed as medium, the impact magnitude is low.

7.3.2.1.2.2 Mitigation measure and impact after mitigation

No measure is recommended.

The proposed measures result in a medium severity mitigated impact. Thus, The residual impact is of low magnitude.

7.3.2.1.3 Impact BioT-Hab-W-Def-3: Impact on Coastal vegetation dominated by Ipomoea pes caprae

7.3.2.1.3.1 Impact before mitigation

The different areas which are concerned by the project are detailed in the table below.

Items	Area/number of specimens inside the area of influence (ha)	Area/number of specimens inside the project footprint (ha)
Coastal vegetation dominated by Ipomoea pes caprae	11,52	3,47

The impact is the loss of semi-natural vegetation and some ecosystem functions.

The impact severity is medium. Considering the receptor sensitivity assessed as medium, the impact magnitude is low.

7.3.2.1.3.2 Mitigation measure and impact after mitigation

No measure is recommended.

The proposed measures result in a medium severity mitigated impact. Thus, The residual impact is of low magnitude.

7.3.2.1.4 Impact BioT-Hab-W-Def-4: Impact on Anthropized areas

7.3.2.1.4.1 Impact before mitigation

The different areas which are concerned by the project are detailed in the table below.

Items	Area/number of specimens inside the area of influence (ha)	Area/number of specimens inside the project footprint (ha)
Anthropized areas	62,77	11,85

The impact is the loss of semi-natural vegetation and some ecosystem functions.

The impact severity is not significant. Considering the receptor sensitivity assessed as low, **the impact magnitude is negligible.**

7.3.2.1.4.2 Mitigation measure and impact after mitigation

No measure is recommended.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of **negligible magnitude.**

7.3.2.1.5 Impact BioT-Hab-W-Def-5: Impact on Grazing lands on Dry forest

7.3.2.1.5.1 Impact before mitigation

The different areas which are concerned by the project are detailed in the table below.

Items	Area/number of specimens inside the area of influence (ha)	Area/number of specimens inside the project footprint (ha)
Dry forest	17,57	0,67

The impact is the loss of semi-natural vegetation and some ecosystem functions.

The impact severity is medium. Considering the receptor sensitivity assessed as major, **the impact magnitude is high.**

7.3.2.1.5.2 Mitigation measure and impact after mitigation

Avoidance measure (BioT-Av-1): Avoid remarkable trees located at the project edge

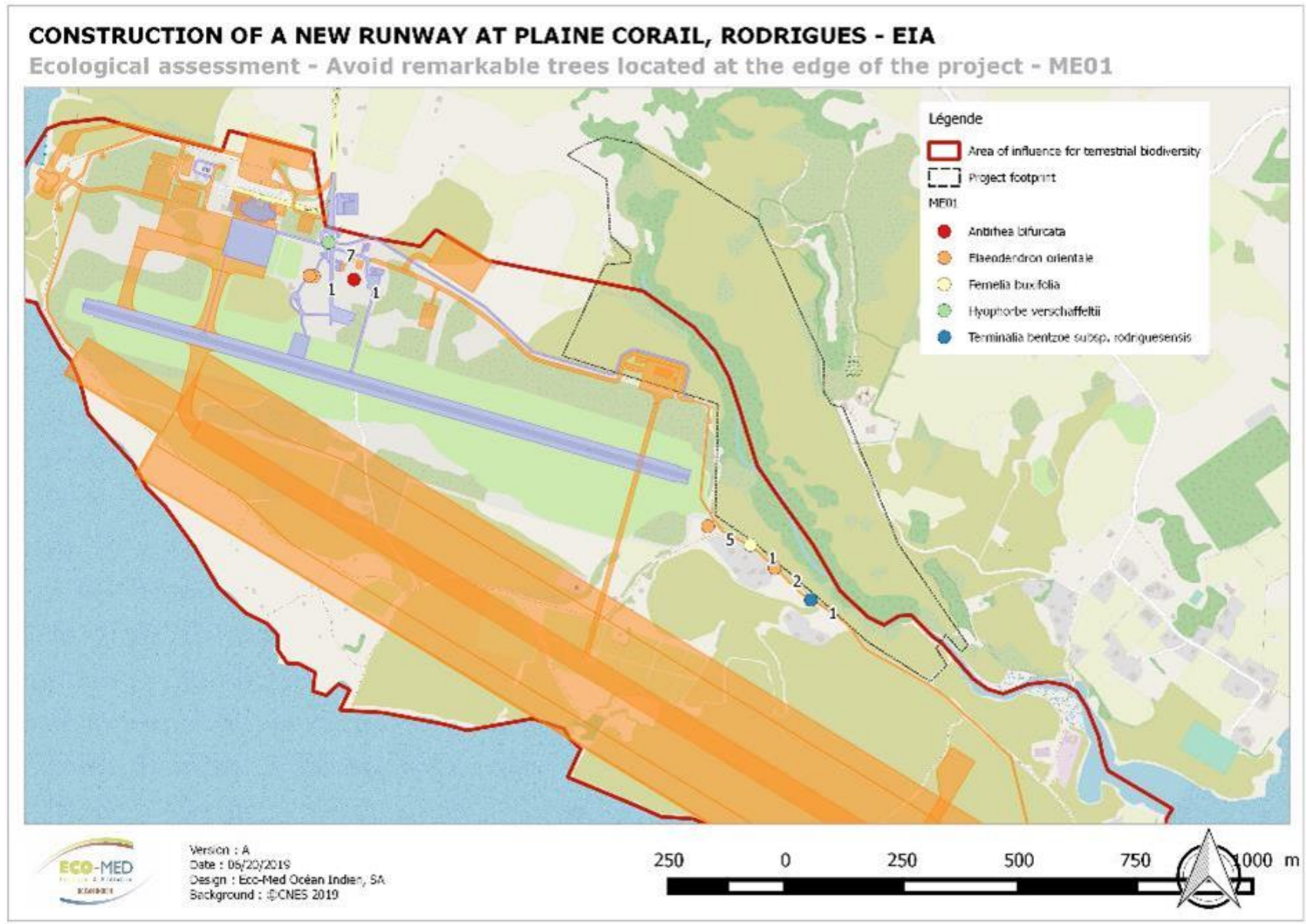
This measure consists in avoiding the destruction of remarkable trees located at the boundaries of the project footprint by locally adapting the project boundaries. A total of 19 trees could be easily avoided, as shown by the table and the map below.

Targeted species	Number of specimens avoided
Antirhea bifurcata	1
Elaeodendron orientale	9
Fernelia buxifolia	1
Hyophorbe verschaffeltii	7
Terminalia bentzoe subsp. rodriguesensis	1



Implementation conditions / Points of vigilance: these 19 trees must be marked prior to the works phase with permanent devices (fences, ribbons, paintings...) and tagged with an identification number (ID) in order to be properly followed during the works phase.

The responsible person or structure for this measure could be the contractor or ARL, and the potential partners: Mauritius Wildlife Foundation or Forestry Services.



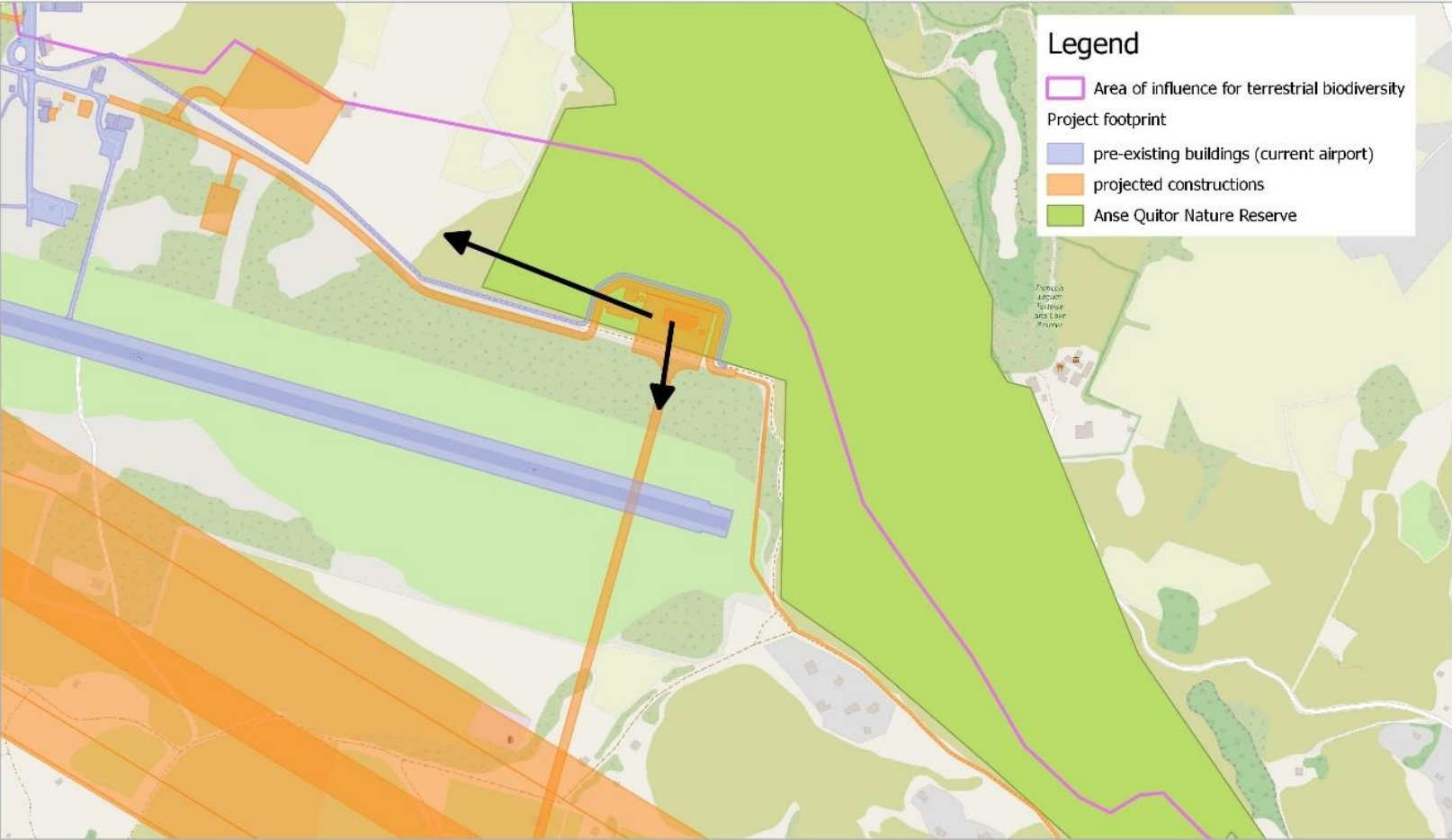


Avoidance measure (BioT-Av-2): Moving the control tower out of the nature reserve

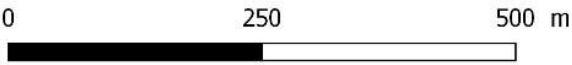
This measure consists in avoiding the destruction of approximately 1 hectare of the buffer area of the Anse Quitar nature reserve, as mapped below. This measure allows to save 6 specimens of *Elaeodendron orientale* (2), *Sarcanthemum coronopus* (3) and *Terminalia bentzoe* subsp. *Rodriguesensis* (1).

The responsible person or structure for this measure could be the contractor or ARL, and the potential partners: Wildlife Foundation and Forestry Services for the official limits of the nature reserve.

CONSTRUCTION OF A NEW RUNWAY AT PLAINE CORAIL, RODRIGUES - EIA
Avoidance measure ME2 : Moving the control tower out of the nature reserve



Version : A
Date : 24/06/2019
Design : ECO-MED Océan Indien
Map background : OpenStreetMAP



Reduction measure (BioT-Mit-3): Creating an arboretum of endemic species inside the airport landscaping

This measure consists in planting 80 specimens of rare and endangered endemic species within the airport limits after the extension airstrip project. This aims to protect, preserve and create an arboretum of endemic seeds that will be used afterwards to produce endemic plants for the nature reserves in Rodrigues.

(An attempt to transplant all or part of the remarkable trees intended to be destroyed by the project is also proposed (in the least, Diospyros, Terminalia, Foetidia, Antirhea): reduction measure 2 and reduction measure 4).

A complementary list of species is proposed below, in regard of the impacts of the project on endemic flora.

Scientific name	French name	Family	Status	Type
<i>Clerodendrum laciniatum</i> Balf.f.	Bois cabri	Lamiaceae	Endemic	Bush
<i>Fernelia buxifolia</i> Lam.	Bois bouteille	Rubiaceae	Sub-endemic	Bush
<i>Hyophorbe verschaffeltii</i> H. Wendl.	Palmiste marron	Arecaceae	Endemic	Palm
<i>Latania verschaffeltii</i> Lem.	Latanier jaune	Arecaceae	Endemic	Palm
<i>Polyscias rodriguesiana</i> (Marais) Lowry & G.M. Plunkett	Bois blanc	Araliaceae	Endemic	Tree
<i>Ramosmania rodriguesii</i> Tirveng.		Rubiaceae	Indigène (Endemic ?)	Tree

Implementation conditions / Points of vigilance: A partnership with the Forestry Services or the Mauritius Wildlife Fondation will be conducted in order to produce seedlings of native species from seeds, cuttings or juveniles collected from the nature reserves of Rodrigues and/or Mauritius.

Collection of plant material will be authorized in advance by the reserve managers in any case.

A specific protocol will be designed for trees transplantation.

The responsible person or structure for this measure could be the contractor or ARL, and the potential partners: Mauritius Wildlife and Forestry Services.

Reduction measure (BioT-Mit-4): Transplant remarkable trees and ferns intended to be cut down during the works phase

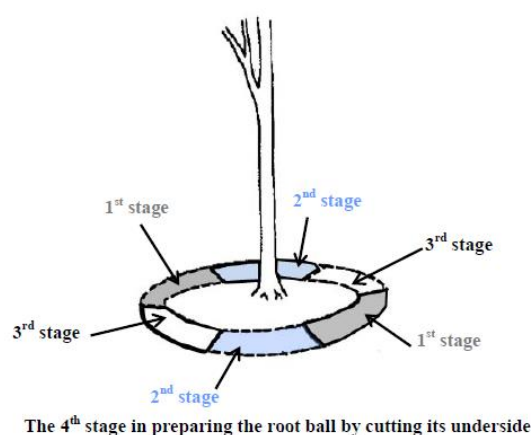
This measure consisting in transplanting all or part of the remarkable trees and ferns intended to be destroyed by the project is also proposed (in priority, Diospyros, Terminalia, Foetidia, Antirhea, Nephrolepis).

Targeted species	Number of specimen targeted for transplantation
Adiantum rhizophorum	1
Diospyros diversifolia	1
Elaeodendron orientale	182
Foetidia rodriguesiana	2
Nephrolepis biserrata	1
Pandanus heterocarpus	25
Phyllanthus dumentosus	1
Sarcanthemum coronopus	1
Terminalia bentzoe subsp. rodriguesensis	2

Transplantating operations (Source: Guidelines on Tree Transplanting, Greening, Landscape and Tree Management Section Development Bureau - The Government of the Hong Kong Special Administrative Region - September 2014):

- 1 - Tools and equipment:
 - All tools and equipment should be appropriate to the operations and prepared in advance. Digging and root pruning tools shall be sharp and clean in order to cut without breaking, crushing or tearing roots;
 - Lifting cables, chains, straps, and/or slings can be used to lift the tree and its roots out of the ground;
- 2- Timing of transplantation:
 - In general, summer is not a common transplanting season as evapo-transpiration rate is high and the transplanted trees will be under stress when transplanting work is taking place during that time.
 - Before the rainy season seems like an optimal time (October to December)
- 3 – Preparation of rootball:
 - Root pruning is sometimes required before transplanting a tree. Sufficient time should be allowed between preparation and final lifting for development of new roots capable of sustaining and continuing the growth of the transplanted tree;
 - The root system of a woodland or open-grown tree will normally be widespread. Lifting such trees without initial preparation of a root ball will result in much of the root system being left in the soil. After transplanting, the tree crown may then die back, or the tree may not be able to recover and will die eventually;
 - In general, the root ball diameter to tree diameter ranges from 8:1 to 10:1 according to international standards (except for a palm which may require a smaller root ball). The root ball sizes should be of a diameter and depth encompassing enough of the root system as necessary for establishment.
- 4 - Stage digging:
 - Root pruning to form a reasonable size of root ball is required and may be adjusted to suit specific tree species and/or imposed project constraints. For mature trees, root pruning is usually required to be carried out at different stages with a minimum of 1 month allowed for root regeneration between cuts. Stage digging can be carried out in

- the following stages in situations if the locations and work program are considered suitable. The four stages are:
- 1st stage – Dig a trench on the outside of the marked circumference in only two opposing segments;
 - 2nd stage – After a period of no less than 1 month since the 1st root pruning, dig a trench on the outside of the marked circumference in the adjacent two opposing segments;
 - 3rd stage – After another period of no less than 1 month since the 2nd root pruning, dig a trench on the outside of the marked circumference, in the remaining two opposing segments; and
 - 4th stage – After a further period of not less than 1 month since the 3rd root pruning, prepare the root ball and cut the underside of the root ball, followed by uplifting and transplanting
 - Cuts must be clean to avoid tearing or breaking the roots.



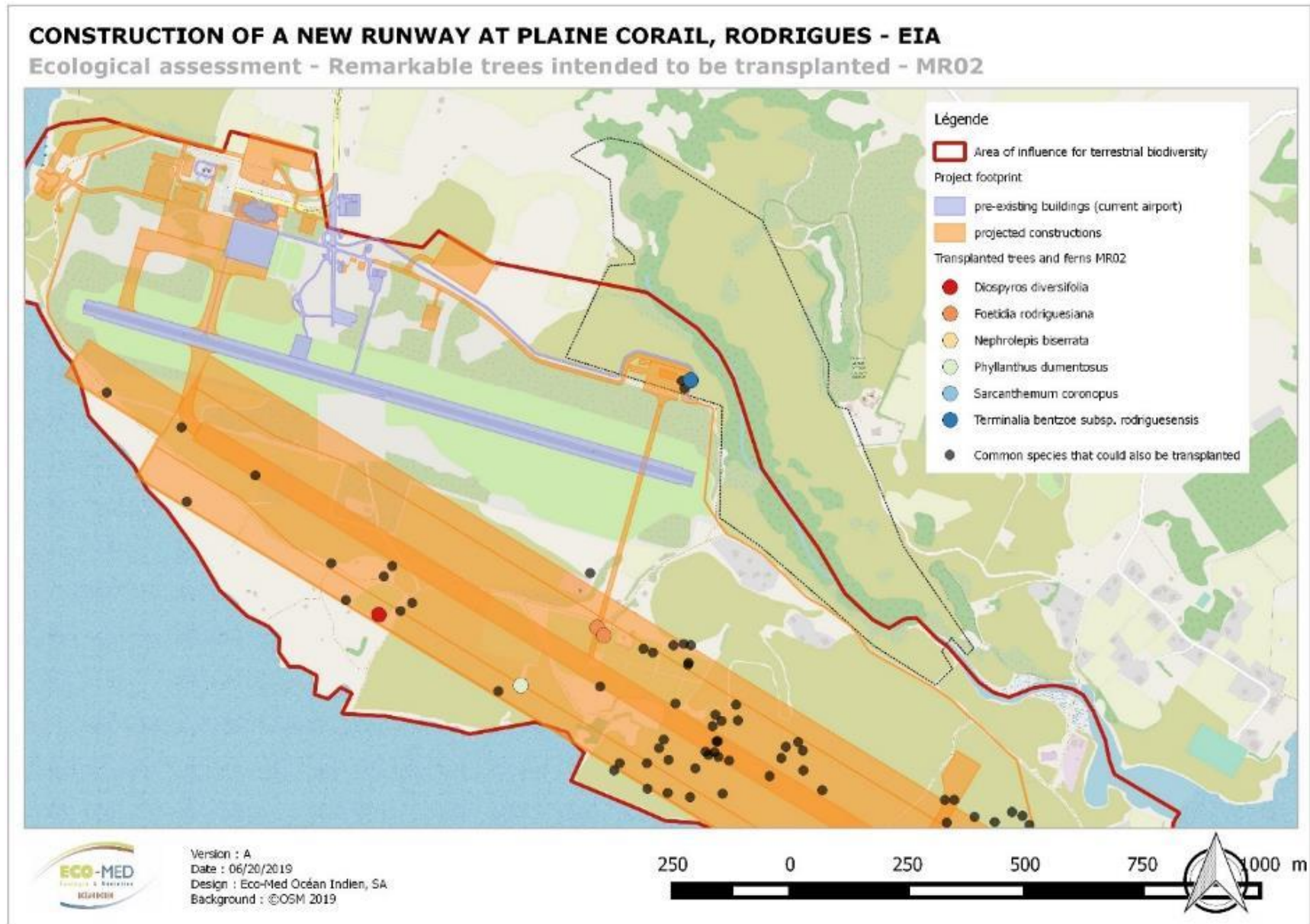
- 5 – Crown pruning
- Pruning of tree crown during transplanting may not be necessarily beneficial to the trees as thinning the crown can reduce the tree's capability in making food and building up reserves. Excessive pruning can ruin the natural form of a tree and reduce photosynthesis.
- Crown cleaning however can be carried out to remove unhealthy, damaged, diseased, dead and crossed branches so as to minimize susceptibility to pests and diseases.
- 6 – Tree lifting operations
- Tree lifting operations shall be carefully timed so as to enable direct delivery to the receptor site. No transplanting operation should commence until either the receptor site or the holding nursery is fully prepared.
- Damp hessian is placed on the sides and across the top of the ball and pinned. The hessian should cover the full circumference of the root ball with bottom skirt hanging out.
- The root ball should be properly wrapped before lifting. Lifting should be done by direct lift, with padded protection for the tree, using a machine of appropriate capacity connected to the support around the root ball, not to any other part of the tree. The tree should not be lifted by the trunk as this can cause serious trunk injury but by its root ball which should be properly prepared and wrapped. Root balls that are not properly protected would easily collapse during transplanting due to their own weight.
- 7 - Protection during transportation
- Trees are often too tall to be transplanted in the upright position and are tipped to a horizontal position. Root balls may be flattened during transportation. When trees are

- being loaded on a lorry or trailer bed, care must be taken to avoid injuring the tree or breaking the soil ball. The crown of the tree should be carefully wrapped to minimize the risk of drying, branch damage due to excessive movements, and wind damage.
- 8 - Preparation of receptor site
 - Trees will not tolerate highly compacted soil, which should be broken up over as large an area of the site as possible. Planting pits should be provided with drainage to allow effective percolation of water.
 - During pit preparation, the existing topsoil ploughed from digging should be stripped and put aside for reuse as much as possible and to avoid a distinct interface between the planting pit and the surrounding soil.
 - In general, the depth of the planting hole shall not exceed the depth of the root ball and the sides of the planting hole should be scarified.
 - 9 – Planting
 - Trees should preferably be placed in the same orientation from which they originated.
 - All root ball supporting materials should be removed from the planting hole prior to final back filling
 - When finally set, the top surface of the root ball should not be below the surrounding soil;
 - The backfill soil should be tamped firmly around the base to stabilise a tree, but the rest of the soil should be tamped only lightly, or left to settle on its own;
 - Mulch can be used to conserve soil moisture, to buffer soil temperature extremes, to control weeds and other competing vegetation, and to replenish organic matters and nutrients in the soil.

Sufficient and appropriate watering is important for proper root growth. Provision should be made for watering, allowing for total wetting of the rooting volume to minimize susceptibility to stress and assure survival.

Implementation conditions / Points of vigilance: A competent and trained external coordinator of the transplantation protocol will be mobilized.

The responsible person or structure for this measure could be the contractor or ARL, and the potential partners: Mauritius Wildlife and Forestry Services.



Reduction measure (BioT-Mit-5): Genetic conservation of populations of impacted rare species

In response to the destruction of several rare species specimens, this measure consists in ensuring the production and reintroduction of clones and genetic ancestors of these species in order to preserve their genetic lineage in the long term. A total of 14 to 35 specimens will be produced, depending on the results obtained by vegetative and sexual propagation.

The entire project is conditional on the success of this measure.

- 1 - Targeted species

The targeted species are those that will be threatened by the project after avoidance measures. One exception is *Zanthoxylum paniculatum* as the species is of major sensitivity in the area of influence and is in a very bad situation in Rodrigues - 3 plants left. Another exception is *Antirhea bifurcata*, one specimen will be left alive inside the airport limits: this species has become very rare in Rodrigues and requires conservation efforts.

Targeted species	French name	Family	Status	IUCN (status retained)	Number of specimens destroyed by the project	Comment	Proposed number of plants to be produced
<i>Antirhea bifurcata</i> (Desr.) Hook.f.	Bois goudron	Rubiaceae	Sub-endemic	CR	0	See avoidance measure BioT-Av-1	2 to 5
<i>Diospyros diversifolia</i> Hiern	Bois d'ébène / Ebénier	Ebenaceae	Endemic	EN	1		2 to 5
<i>Foetidia rodriguesiana</i> F. Friedmann	Bois puant	Lecythidaceae	Endemic	CR	2		2 to 5
<i>Terminalia bentzoe</i> (L.) G.Forst. subsp. <i>rodriguesensis</i> Wickens	Bois benjoin	Combretaceae	Endemic	Not listed	1	See avoidance measure BioT-Av-2	2 to 5
<i>Zanthoxylum paniculatum</i> Balf. f.	Bois pasner	Rutaceae	Endemic	CR	0	Very rare species located inside the nature reserve	2 to 5
<i>Elaeodendron orientale</i> Jacq.	Bois rouge	Celastraceae	Sub-endemic	LC	182		2 to 5
<i>Pandanus heterocarpus</i> Balf. f.	Vacoa parasol	Pandanaceae	Endemic	NT	25		2 to 5

- 2 - Harvesting of plant material

Two methods can be used at the same time to ensure the effectiveness of the measure:

- a. By collecting seeds: Several campaigns have to be scheduled in order to target the right periods of fruiting. It requires to have someone locally implanted who can watch the different specimen on a regular basis (1 time every month for a year). As an indication, here are the flowering periods for the following genera in Reunion Island:

Foetidia = February; *Elaeodendron* = from July to January; *Zanthoxylum* = June/July; *Pandanus* = from January to March; *Terminalia bentzoe* = from August to November; *Diospyros* = December; *Antirhea* = rainy season

Seeds have already been collected for *Foetidia rodriguesiana* by the Forestry services in July 2019 (Payandee, com. Pers.).

Species of high sensitivity impacted by the project	Cuttings	Layering	Grafting	Sowing	Germination rate?
<i>Diospyros diversifolia</i>	?	?	?	<p>No dormancy reported for its sister species <i>D. borbonica</i></p> <p><i>An adult tree can produce 1500 fruits, each containing 10 to 12 seeds</i></p>	<p>Germination rate is very good and can get to 60% but transplanting them then can get down to 50% on the total transplanted. The plantation success is very low as it is very sensitive to drought or heavy rainfall. The survival rate is around 30 to 40% and even less in some years.</p> <p>Germination rate of 60 to 80% for its sister species <i>D. borbonica</i></p>
<i>Foetidia rodriguesiana</i>	Seems to work according to (Dupont et al. 1989) but some tests ran by WWF do not confirm this data	Seems to work (Debize et al. 2007) as it works for <i>F. mauritiana</i>	?	Fruit has to be prepared to eliminate dormancy	Highly variable and around 30% for its sister species <i>F. mauritiana</i>
<i>Terminalia bentzoë</i>	?	?	?	Fruit has to be prepared to eliminate dormancy	< 50%

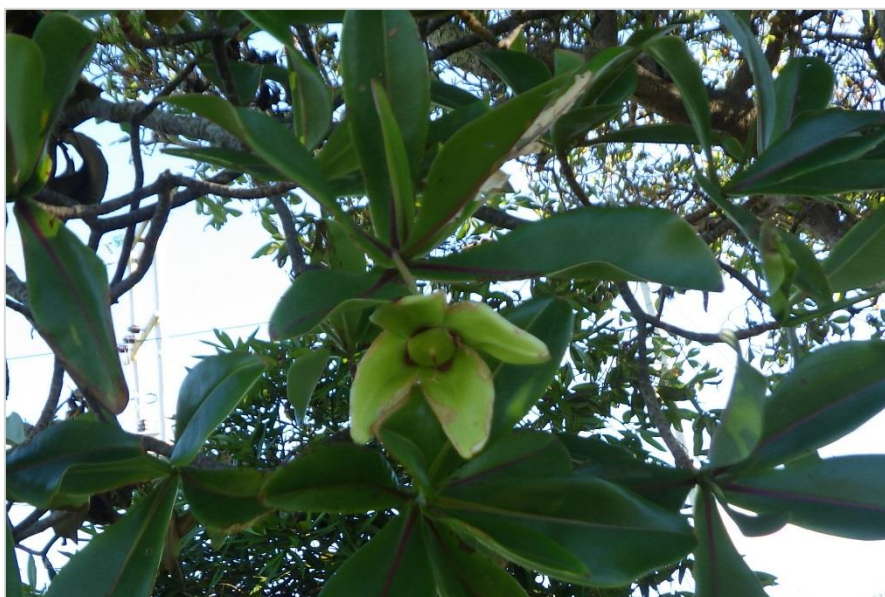


Figure 176: Fruit of *Foetidia rodriguesiana*

- b. By collecting cuttings: to produce clones of the specimens destroyed by the project.

Period of collection: rainy season, from November to March

Take cuttings from the wild specimens: select young straight shoots about the diameter of a pencil (except trailing snowberry, which can be thinner). Collect long branches— they will be divided into individual cuttings later. Cut just above a leaf node. Put the cuttings in a plastic bag or the ends in a bucket of water, and keep them cool, moist, and out of direct sunlight.

Prepare individual cuttings: cut the branches into pieces long enough to have at least three or four leaf nodes (for most species, cuttings will be about 15 cm long). The end of the cutting closest to the roots (the “bottom”) should be cut at a 45° angle just below a node. To not confuse the bottom with the top of the cutting (essential), cut the top at a right angle (straight across) slightly above a node.

Production: while not essential, for some species success is improved by dipping the bottom (angled) end of the cutting in rooting hormone. Fill a pot with an unfertilized fast-draining soil mix (and in many cases perlite, sharp sand or vermiculite alone will work but cuttings need soil after rooting). Poke holes in the soil with a stick a bit larger than the cutting diameter, insert cuttings with at least 2 nodes in soil and 1 or 2 nodes above soil level, tamp soil and water it. Wait until leaf growth unfurls and gently check for substantial root development (it can take a few months). If there are leaves or roots but not the other reinsert the cutting and wait. Cuttings can be transplanted into a soil mix in a larger container, or transplanted into native soil. During a dry spring keep the rooting medium moist. During the following summer, supplemental water will improve survival and development.

- 3 - Plant production

The plants will be kept at the nursery until the receptor site is ready to receive the plant.

- 4 - In situ plantation: see BioT-Mit-3

Focus on *Foetidia* spp.

A sister species of F. rodriguesiana is present in Mauritius and La Réunion. We report here some informations about seeds harvesting, conservation and germination rates for this closely related species of F. rodriguesiana and some informal clarifications for F. rodriguesiana obtained from WWF and the Commission for Forestry from Rodrigues (Alfred Bègue, Richard Payandee).

Collection: *F. mauritiana:* Although the fruit ripens from October to January, it can be picked from the ground all year round because it keeps well.

Seeds: *F. mauritiana:* The fruit is indestructible and waterproof. In nature, it takes several years to deteriorate. This dormancy can be eliminated by breaking the fruit as specified below. It is a delicate operation, which can sometimes destroy seeds. The fruits must be broken into four pieces, by tapping with the short side of a hammer on their diagonal. They are then left to soak for 1 hour in a 5% bleach solution (10 teaspoons of bleach for 1 litre of water) to destroy all the fungi that could harm the young seedling. Out of this bath, they should be rinsed thoroughly.

Storage: *F. mauritiana:* The seed can be kept for more than one year in the fruit at room temperature and more than 5 years in a cold room.

Sowing: *F. mauritiana:* The sowing must be done in boxes on a substrate relatively low in raw organic matter (half earth sieved and half sand). The fruit pieces are then deposited on the surface without covering them. The water from each watering shall contain a fungicide and from time to time an insecticide against ants. The first lifts take place after 15 days at best and may be extended over more than 6 months to 1 year.

Germination rate: *F. mauritiana:* very variable, generally > 30%.

F. rodriguesiana: i) Less than 1% success with no human help for cracking the seeds (10 young plants in 10,000 seeds), ii) 60 -70 % success when using a technique of cracking the seed with a hammer or with a vice to allow water to get inside the seed (imitating the effect of digestion by turtles), iii) One tree produces thousands of seeds.

Cuttings: *F. rodriguesiana:* does not work well according to the few trials carried out by MWF, but might work if carried out by a specialist. Recommended: horticulturists from Kew Garden (Martin Stanyford, Carlos Magdalena) or Brest laboratory.

Plant breeding: *F. mauritiana:* The young root being very fragile, the transplanting must be done as soon as the germ appears (at most 1 cm long). Fungicide treatment should continue as long as the seedling remains at the cotyledon stage. It is advisable to provide containers deep enough for transplanting because the pivot of this relatively long species, has quite a fast development. *F. rodriguesiana:* Almost 100% success when planted excluding invasive species intrusion.

Implementation conditions / Points of vigilance: A partnership with the Forestry Services or the Mauritius Wildlife Fondation will be conducted in order to produce seedlings of native species from seeds, cuttings or juveniles collected from the specimen located within the project footprint.

The responsible person or structure for this measure could be the contractor or ARL, and the potential partners: Mauritius Wildlife and Forestry Services.

Offset measure (BioT-Comp-6): Action plan towards more sustainable agricultural practices for native biodiversity.

This measure consists in initiating a new approach for the management of extensive agriculture on the island of Rodrigues by proposing a turnkey operational action plan.

Grazing land management is the manipulation of the soil-plant-animal complex in pursuit of a desired result. Rodrigues's native shrubs and trees are sometimes desirable plant species for the livestock of which the wandering grazing is almost everywhere. These shrubs and trees not only provide an important food source at certain times throughout the year, but also provide numerous habitat values for a wide array of wildlife species. This includes browsing opportunities for ungulates and feeding and nesting sites for birds and small mammals. However, overuse by livestock leads to the destruction of native species or prevents spontaneous sexual and vegetative reproduction which causes the native flora disappearance.

Here, we propose to set up an action plan to provide concrete elements for the management of grazed areas with regard to biodiversity issues on the island of Rodrigues. Several steps will be necessary for its establishment, including consultation phases with all local stakeholders throughout the process in order to obtain a consensus document for all the Rodriguans.



The grazing management plan should have the following components:

- A definition of goals including livestock production and pasture and range sustainability;
- A definition of biodiversity areas, including isolated trees with high heritage value and riparian health;
- A list of native species that can be or are impacted by livestock grazing;
- A map of grazing areas including all developments such as fences, gates, water sources, etc...
- Type and number of livestock grazing in the pastures;
- Approximate period of use for pastures.

This action plan can be approached by:

- 1-the inventory and consultation of all agricultural and ecologist partners throughout the project;
- 2-the establishment of the development challenges of livestock breeding in Rodrigues;
- 3-drawing up an inventory of actions that can improve the quality and productivity of livestock farming by promoting local biodiversity;

- 4-proposing a fine cartographic work accompanied by spatialized actions throughout the Rodrigues territory.

The responsible person or structure for this measure could be the contractor or ARL, and the potential partners: Wildlife Fondation, Agricultural and Forestry Services, Regional Assemblée.

Offset measure BioT-Comp-7: Ecological restoration within the limits of the Anse Quitor nature reserve

This measure consists in:

- Rebuilding the fence around the Anse Quitor nature reserve, with one that would be similar to the fence around the airport in order to discourage grazing livestock from going inside the reserve. This measure is a short-term response to the grazing vs. biodiversity issue that has to be solved with the offset measure (BioT-Comp-6: Action plan towards more sustainable agricultural practices for native biodiversity).
- Reinforcing native species populations by planting 500 native plant specimens within the Anse Quitor nature reserve buffer area, located besides the future airport boundaries (see map below).

Methods:

- Harvesting:

The geographical origin of the seeds is an important criterion. The producer must be able to provide this information for each plant produced. Labelling (aluminium plate) of individuals may be considered. In addition, if harvests are required, four methods are proposed that are concerned with ecological conservation concepts:

- The objective is to harvest primarily in the area of influence or in the immediate vicinity in order to offer the best guarantees of adaptation and to save the genetic heritage of the site;
- Harvesting within the Anse Quitor nature reserve in priority;
- Harvesting within existing arboretums;
- To harvest in a natural environment requires the intervention of a qualified botanist. In order not to deprive the natural environment of the seeds necessary for its renewal, only one third of the fruits of a tree specimen must be harvested.
- Production of plants:

Harvesting (seeds, cuttings) and production must take place well before the works phase in order to obtain plants of sufficient size for planting and to set up the restoration during the works phase of the project. The aims are:

- To obtain medium-sized plants, for optimal recovery and easy transport;
- To "wean" the plants, i.e. gradually reduce watering to accustom the young trees to the lack of water;
- To promote good root development, for a good nutrition of the plant;
- To limit the use of fertilizers and insecticides.
-
-
- Planting:

Planting should take place in the wet season. Planting plots of 25 m² (5 m x 5 m) of native species with a density of 1 plant/m² will be implemented. A total of 500 individuals will be distributed in 20 25 m² plots.

Planting young plants in dense masses would allow an optimal success rate: better protection of the plants against the sun, limiting competition with weed species... The very high density of indigenous species with rapid growth is a major element for the success of the measure. The plots will be supplied with topsoil to a depth of 1 to 2 metres to stimulate root development.

Several planting techniques can be carried out (mechanical, manual, etc.). We remind you that the young plants must be planted relatively close to each other (1 plant/m²), in order to stimulate their growth and avoid the return of invasive species.

Considering the taking into account of these measures, the magnitude of the mitigated impact is negligible.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of **negligible magnitude**.

Table 104: Targeted plant species

Scientific name	French name	Family	Status	Type
<i>Adiantum rhizophorum</i> Sw.		Pteridaceae	Sub-endemic	Herbaceous
<i>Allophylus borbonicus</i> (J.F. Gmel.) F. Friedmann	Bois de merle	Sapindaceae	Sub-endémique	Tree
<i>Aloe lomatophylloides</i> Balf. f.	Ananas marron	Asphodelaceae	Endémique ROD	Herbaceous
<i>Antirhea bifurcata</i> (Desr.) Hook.f.	Bois goudron	Rubiaceae	Sub-endemic	Tree
<i>Campocarpus sphenophyllus</i> (Balf. F.)		Asclepiadaceae	Endemic	Liane
<i>Canavalia rosea</i> (Sw.) DC.	Liane cocorico	Fabaceae	Indigène	Herbaceous
<i>Carissa spinarum</i> L.	Bois amer	Apocynaceae	Indigène	Bush
<i>Carissa xylopicron</i>	Bois de ronde	Apocynaceae	Indigène	Bush
<i>Cassytha filiformis</i> L.	Liane foutafout	Lauraceae	Indigène	Liane
<i>Clerodendrum laciniatum</i> Balf.f.	Bois cabri	Lamiaceae	Endemic	Bush
<i>Cynodon dactylon</i> (L.) Pers.	Petit-chiendent	Poaceae	Indigenous	Herbaceous
<i>Dactyloctenium ctenoides</i> (Steud.) Lorch ex Bosser		Poaceae	Indigenous	Herbaceous
<i>Dictyosperma album</i> (Bory) H. Wendl. et Drude ex Scheff.	Palmiste blanc	Arecaceae	Sub-endémique	Palm
<i>Diospyros diversifolia</i> Hiern	Bois d'ébène / Ebénier	Ebenaceae	Endemic	Tree
<i>Dodonaea viscosa</i> Jacq.	Bois d'arnette	Sapindaceae	Indigenous	Bush
<i>Dombeya acutangula</i> Cav.	Mahot tantan	Malvaceae	Sub-endémique	Bush
<i>Dombeya rodriguesiana</i> F. Friedmann	Mahot / Bois Julien	Malvaceae	Endémique ROD	Bush
<i>Doricera trilocularis</i>	Bois chauve-souris	Rubiaceae	Endémique ROD	Bush
<i>Dracaena reflexa</i> Lam.	Bois de chandelle	Asparagaceae	Indigenous	Tree
<i>Elaeodendron orientale</i> Jacq.	Bois rouge	Celastraceae	Sub-endemic	Tree
<i>Eugenia rodriguesensis</i> J. Guého & A.J. Scott	Bois fer	Myrtaceae	Endémique ROD	Tree
<i>Fernelia buxifolia</i> Lam.	Bois bouteille	Rubiaceae	Sub-endemic	Bush
<i>Ficus reflexa</i> Thunb.	Ti l'affouche	Moraceae	Indigenous	Tree
<i>Ficus rubra</i> Vahl	Affouche rouge	Moraceae	Indigenous	Tree
<i>Foetidia rodriguesiana</i> F. Friedmann	Bois puant	Lecythidaceae	Endemic	Tree
<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. et Schult.	Herbe polisson	Poaceae	Indigenous	Herbaceous

Scientific name	French name	Family	Status	Type
<i>Hibiscus liliiflorus</i> Cav.	Augerine	Malvaceae	Sub-endémique	Tree
<i>Hibiscus tiliaceus</i> L.	Var	Malvaceae	Indigène	Tree
<i>Hyophorbe verschaffeltii</i> H. Wendl.	Palmiste marron	Arecaceae	Endémique	Palm
<i>Ipomoea pes-caprae</i> (L.) R. Br.	Liane batatran	Convolvulaceae	Indigène	Herbacéous
<i>Ipomoea pes-caprae</i> (L.) R. Br. subsp. <i>brasiliensis</i> (L.) Ooststr.	Patate à Durand	Convolvulaceae	Indigène	Herbacéous
<i>Latania loddigesii</i> Mart.	Latanier bleu	Arecaceae	Endémique MAU	Palm
<i>Latania verschaffeltii</i> Lem.	Latanier jaune	Arecaceae	Endémique	Palm
<i>Lycium mascarenense</i> A.M. Venter et A.J. Scott	Souveraine de mer	Solanaceae	Indigène	Bush
<i>Mathurina penduliflora</i> Balf. f.	Bois gandine	Passifloraceae	Endémique	Bush
<i>Mucuna gigantea</i> (Willd.) DC.		Fabaceae	Indigène	Liane
<i>Nephrolepis acutifolia</i> (Desv.) Christ		Nephrolepidaceae	Indigène	Herbacéous
<i>Nephrolepis biserrata</i> (Sw.) Schott	Fougère rivière	Nephrolepidaceae	Indigène	Herbacéous
<i>Obetia ficifolia</i> (Poir.) Gaudich.	Bois d'ortie	Urticaceae	Sub-endémique	Tree
<i>Pandanus heterocarpus</i> Balf. f.	Vacoa parasol	Pandanaceae	Endémique	Tree
<i>Pemphis acidula</i> J.R. Forst. et G. Forst.	Bois matelot	Lythraceae	Indigène	Bush
<i>Phyllanthus casticum</i> Soy.-Will.	Bois de demoiselle	Phyllanthaceae	Indigène	Bush
<i>Phyllanthus dumentosus</i> Poir.		Phyllanthaceae	Indigène	Bush
<i>Pisonia grandis</i> R. Br.	Bois mapou	Nyctaginaceae	Indigène	Tree
<i>Pittosporum balfourii</i> Cuf.	Bois bécasse	Pittosporaceae	Endémique ROD	Bush
<i>Pleurostyliya putamen</i> Marais	Bois d'olive blanc	Celastraceae	Endémique	Bush
<i>Polyscias rodriguesiana</i> (Marais) Lowry & G.M. Plunkett	Bois blanc	Araliaceae	Endémique	Tree
<i>Poupartia castanea</i> (Baker) Engl.	Bois lubine / figue marron	Anacardiaceae	Endémique ROD	Tree
<i>Premna serratifolia</i> L.	Bois sureau	Lamiaceae	Sub-endémique	Tree
<i>Ramosmania rodriguesii</i> Tirveng.		Rubiaceae	Indigène (Endémique ROD?)	Tree
<i>Sarcanthemum coronopus</i> Cass.		Asteraceae	Endémique	Bush
<i>Sarcostemma viminale</i> (L.) R. Br.	Liane calé	Apocynaceae	Indigène	Bush
<i>Scolopia heterophylla</i> (Lam.) Sleumer	Goyave marron	Salicaceae	Sub-endémique	Tree
<i>Scutia myrtina</i> (Burm. f.) Kurz	Bois de sinte	Rhamnaceae	Indigène	Bush
<i>Secamone rodriguesiana</i> F.Friedmann		Apocynaceae	Endémique	Liane
<i>Securinega durissima</i> J.F. Gmel.	Bois dur	Phyllanthaceae	Indigène	Tree
<i>Tephrosia purpurea</i> (L.) Pers.	Lentille marronne	Fabaceae	Indigène	Herbacéous
<i>Terminalia bentzoe</i> (L.) G.Forst. subsp. <i>rodriguesensis</i> Wickens	Bois benjoin	Combretaceae	Endémique	Tree



Enviro-Consult Ltd



INSUCO

Scientific name	French name	Family	Status	Type
<i>Thespesia populnea</i> (L.) Sol. ex Corrêa	Sainte Marie	Malvaceae	Indigenous	Tree
<i>Thespesia populneoides</i> (Roxb.) Kostel.	Porché	Malvaceae	Indigène	Tree
<i>Tournefortia argentea</i> L.f.	Veloutier argenté	Boraginaceae	Indigenous	Tree
<i>Turraea lacinata</i> (Balf. f.) Harms	Bois balai	Meliaceae	Endémique ROD	Tree
<i>Vepris lanceolata</i> (Lam.) G. Don	Patte poule	Rutaceae	Indigène	Tree
<i>Zanthoxylum heterophyllum</i> (Lam.) Sm.	Bois de poivre	Rutaceae	Sub-endémique	Tree
<i>Zanthoxylum paniculatum</i> Balf. f.	Bois pasner	Rutaceae	Endemic	Tree
<i>Zoysia matrella</i> (L.) Merr.	Herbe pique-fesses	Poaceae	Indigène	Herbacéous

CONSTRUCTION OF A NEW RUNWAY AT PLAINE CORAIL, RODRIGUES - EIA

Offset measure MC02 : Ecological restauration within the limits of the Anse Quitor nature reserve



Version : A
Date : 24/06/2019
Design : ECO-MED Océan Indien
Map background : OpenStreetMap



7.3.2.1.6 Impact BioT-Hab-W-Def-6: Impact on grazing lands on riparian vegetation

7.3.2.1.6.1 Impact before mitigation

The different areas which are concerned by the project are detailed in the table below.

Items	Area/number of specimens inside the area of influence (ha)	Area/number of specimens inside the project footprint (ha)
Riparian vegetation	1,20	0

The impact is the loss of semi-natural vegetation and some ecosystem functions.

The impact severity is not significant. Considering the receptor sensitivity assessed as medium, the impact magnitude is negligible.

7.3.2.1.6.2 Mitigation measure and impact after mitigation

No measure is recommended.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of negligible magnitude.

7.3.2.1.7 Impact BioT-Hab-W-Def-7: Impact on grazing lands on estuarine habitat

7.3.2.1.7.1 Impact before mitigation

The different areas which are concerned by the project are detailed in the table below.

Items	Area/number of specimens inside the area of influence (ha)	Area/number of specimens inside the project footprint (ha)
Estuarine habitat	8,25	0

The impact is the loss of semi-natural vegetation and some ecosystem functions.

The impact severity is not significant. Considering the receptor sensitivity assessed as medium, the impact magnitude is negligible.

7.3.2.1.7.2 Mitigation measure and impact after mitigation

No measure is recommended.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of negligible magnitude.

7.3.2.1.8 Impact BioT-Hab-W-Def-8: Impact on grazing lands on calcarenic dry lawns of anthropogenic origin

7.3.2.1.8.1 Impact before mitigation

The different areas which are concerned by the project are detailed in the table below.

Items	Area/number of specimens inside the area of influence (ha)	Area/number of specimens inside the project footprint (ha)
Calcareous dry lawns of anthropogenic origin	2,19	0,07

The impact is the loss of semi-natural vegetation and some ecosystem functions.

The impact severity is not significant. Considering the receptor sensitivity assessed as medium, the impact magnitude is negligible.

7.3.2.1.8.2 Mitigation measure and impact after mitigation

No measure is recommended.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of negligible magnitude.

7.3.2.1.9 Impact BioT-Hab-W-Def-9: Impact on coastal grasslands dominated by secundarized thickets (Lantana camara)

7.3.2.1.9.1 Impact before mitigation

The different areas which are concerned by the project are detailed in the table below.

Items	Area/number of specimens inside the area of influence (ha)	Area/number of specimens inside the project footprint (ha)
Coastal grasslands dominated by secundarized thickets (Lantana camara)	25,55	17,68

The impact is the loss of semi-natural vegetation and some ecosystem functions.

The impact severity is low. Considering the receptor sensitivity assessed as low, the impact magnitude is low.

7.3.2.1.9.2 Mitigation measure and impact after mitigation

No measure is recommended.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of low magnitude.

7.3.2.1.10 Impact BioT-Hab-W-Def-10: Impact on secundarized thickets (Leucaena leucocephala)

7.3.2.1.10.1 Impact before mitigation

The different areas which are concerned by the project are detailed in the table below.



Items	Area/number of specimens inside the area of influence (ha)	Area/number of specimens inside the project footprint (ha)
Secundarized thickets (Leucaena leucocephala)	23,84	10,92

The impact is the loss of semi-natural vegetation and some ecosystem functions.

The impact severity is low. Considering the receptor sensitivity assessed as low, **the impact magnitude is negligible.**

7.3.2.1.10.2 Mitigation measure and impact after mitigation

No measure is recommended.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of **negligible magnitude.**

7.3.2.1.11 Summary

Table 105: Permanent impact during Construction - Biological Environment – Terrestrial Habitat

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
BioT-Hab-W-Def-1	Impact on grazing lands on basaltic resurgences	Adverse	Low	None	None	Low
BioT-Hab-W-Def-2	Impact on grazing lands on calcarenic substratum	Adverse	Low	None	None	Low
BioT-Hab-W-Def-3	Impact on coastal vegetation dominated by Ipomoea pes caprae	Adverse	Low	None	None	Low
BioT-Hab-W-Def-4	Impact on anthropized areas	Adverse	Negligible	None	None	Low
BioT-Hab-W-Def-5	Impact on dry forest	Adverse	Medium	BioT-Av-1	Avoid remarkable trees located at the edge of the project	Negligible
				BioT-Av-2	Moving the control tower out of the nature reserve	
				BioT-Mit-3	Creating an arboretum of endemic species inside the airport landscaping	
				BioT-Mit-4	Transplant remarkable trees and ferns intended to be cut down during the works phase	
				BioT-Mit-5	Genetic conservation of populations of impacted rare species	
				BioT-Comp-6	Action plan towards more sustainable agricultural practices for native biodiversity.	
				BioT-Comp-7	Ecological restauration within the limits of the Anse Quitor nature reserve	
BioT-Hab-W-Def-6	Impact on riparian vegetation	Adverse	Negligible	None	None	Negligible

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
BioT-Hab-W-Def-7	Impact on estuarine habitat	Adverse	Negligible	None	None	Negligible
BioT-Hab-W-Def-8	Impact on calcarenic dry lawns of anthropogenic origin	Adverse	Negligible	None	None	Negligible
BioT-Hab-W-Def-9	Impact on coastal grasslands dominated by secundarized thickets (Lantana camara)	Adverse	Low	None	None	Low
BioT-Hab-W-Def-10	Impact on secundarized thickets (Leucaena leucocephala)	Adverse	Negligible	None	None	Negligible

7.3.2.2 Terrestrial flora

A total of 7 specimens of major sensitivity, 8 specimens of high sensitivity and 27 specimens of medium sensitivity are expected to be destroyed by the project: see table below.

Amongst low sensitivity species, 2 require special attention:

- *Eleodendron orientale*: subendemic and LC (least concerned), the local population of this species in Plaine Corail is quite large and will be largely destroyed by the project (191 individuals out of 264 censored in total within the area of influence). The total population in Rodrigues is estimated at between 500 and 1000 individuals and the species is present in almost all valleys of the island along the coast.
- *Phyllanthus dumentosus*: indigenous and VU (vulnerable), this species looks quite common elsewhere in Rodrigues. Its sensitivity for the project is therefore assessed at low.

Table 106. Number of native flora specimens destroyed by the project

Flora species	Sensitivity				Total
	Major	High	Medium	Low	
<i>Adiantum rhizophorum</i>			1		1
<i>Antirhea bifurcata</i>		1			1
<i>Diospyros diversifolia</i>		1			1
<i>Elaeodendron orientale</i>				191	191
<i>Fernelia buxifolia</i>		1			1
<i>Fimbristylis cymosa</i>					
<i>Foetidia rodriguesiana</i>		2			2
<i>Hyophorbe verschaffeltii</i>	7				7
<i>Nephrolepis biserrata</i>			1		1
<i>Pandanus heterocarpus</i>			25		25
<i>Phyllanthus dumentosus</i>				1	1
<i>Sarcanthemum coronopus</i>			1		1
<i>Terminalia bentzoe subsp. rodriguesensis</i>		3			3
Total	7	8	28	192	235

Direct destruction of these species implies an overall impact magnitude assessed to high level.

Detailed impact sensitivity and magnitude are exposed below.

7.3.2.2.1 Impact BioT-Flo-W-Def-1: Impact on *Hyophorbe verschaffeltii*

7.3.2.2.1.1 Impact before mitigation

The number of specimens inside the project is detailed in the table below.

Sub items	Area/number of specimens inside the area of influence	Area/number of specimens inside the project footprint	Comments
<i>Hyophorbe verschaffeltii</i>	43	7	Impacted specimens are known to be of domestic origin

The impact is the loss of native trees from a major sensitivity for the island of Rodrigues.

The impact severity is medium. Considering the receptor sensitivity assessed as major, the impact magnitude is high.

7.3.2.2.1.2 Mitigation measure and impact after mitigation

Avoidance measure BioT-Av-1: Avoid remarkable trees located at the edge of the project

Reduction measure BioT-Mit-3: Creating an arboretum of endemic species inside the airport landscaping

Reduction measure BioT-Mit-4: Transplant remarkable trees and ferns intended to be cut down during the works phase

Reduction measure BioT-Mit-5: Genetic conservation of populations of impacted rare species

Offset measure BioT-Comp-6: Action plan towards more sustainable agricultural practices for native biodiversity

Offset measure BioT-Comp-7: Ecological restauration within the limits of the Anse Quitor nature reserve

All these measures are presented in the chapter 7.3.2.1 Terrestrial habitat.

The proposed measures result in a medium severity mitigated impact. Thus, The residual impact is of low magnitude.

7.3.2.2.2 Impact BioT-Flo-W-Def-2: Impact on *Polyscias rodriguesiana*

7.3.2.2.2.1 Impact before mitigation

The number of specimens inside the project is detailed in the table below.

Sub items	Area/number of specimens inside the area of influence	Area/number of specimens inside the project footprint	Comments
<i>Polyscias rodriguesiana</i>	7	0	/

The impact is the loss of native trees of a major sensitivity for the island of Rodrigues. This impact severity is negligible (no impact).

The impact severity is not significant. Considering the receptor sensitivity assessed as major, the impact magnitude is negligible.

7.3.2.2.2.2 Mitigation measure and impact after mitigation

No measure is necessary.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of negligible magnitude.

7.3.2.2.3 Impact BioT-Flo-W-Def-3: Impact on *Antirhea bifurcata*

7.3.2.2.3.1 Impact before mitigation

The number of specimens inside the project is detailed in the table below.

Sub items	Area/number of specimens inside the area of influence	Area/number of specimens inside the project footprint	Comments
<i>Antirhea bifurcata</i>	1	1	Has become very rare in Rodrigues

The impact is the loss of native trees of a high sensitivity for the island of Rodrigues.

The **impact severity is major**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is major**.

7.3.2.2.3.2 Mitigation measure and impact after mitigation

Avoidance measure BioT-Av-1: Avoid remarkable trees located at the edge of the project

Reduction measure BioT-Mit-3: Creating an arboretum of endemic species inside the airport landscaping

Reduction measure BioT-Mit-5: Genetic conservation of populations of impacted rare species

Offset measure BioT-Comp-6: Action plan towards more sustainable agricultural practices for native biodiversity

Offset measure BioT-Comp-7: Ecological restoration within the limits of the Anse Quitor nature reserve

All these measures are presented in the chapter 7.3.2.1 Terrestrial habitat.

The proposed measures result in a **major severity mitigated impact**. Thus, The residual impact is of **negligible magnitude**.

7.3.2.2.4 Impact BioT-Flo-W-Def-4: Impact on *Clerodendrum laciniatum*

7.3.2.2.4.1 Impact before mitigation

The number of specimens inside the project is detailed in the table below.

Sub items	Area/number of specimens inside the area of influence	Area/number of specimens inside the project footprint	Comments
<i>Clerodendrum laciniatum</i>	3	0	/

The impact is the loss of native trees of a high sensitivity for the island of Rodrigues. This impact severity is negligible (no impact).

The impact severity is not significant. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is negligible**.

7.3.2.2.4.2 Mitigation measure and impact after mitigation

No measure is necessary.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of **negligible magnitude**.

7.3.2.2.5 Impact BioT-Flo-W-Def-5: Impact on *Diospyros diversifolia*

7.3.2.2.5.1 Impact before mitigation

The number of specimens inside the project is detailed in the table below.

Sub items	Area/number of specimens inside the area of influence	Area/number of specimens inside the project footprint	Comments
<i>Diospyros diversifolia</i>	1	1	Has become very rare in Rodrigues. The information obtained from wildlife indicates that the number of plants remaining in Rodrigues is about 300 to 500. Their localisation is : Mourouk valley, Cascade St Louis, English Bay (Baie aux Anglais), Creve Coeur, Cascade Pigeon, Oyster Bay (Baie aux Huitres), Cascade Pistache, Plaine Corail, Dan Coco, Rivière Coco, Anse Raffin, Anse Baleine, Cascade Victoire, Port Sud Est The main threats to them are development, grazing, low regeneration.

The impact is the loss of native trees of a high sensitivity for the island of Rodrigues.

The **impact severity is major**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is major**.

7.3.2.2.5.2 Mitigation measure and impact after mitigation

Reduction measure BioT-Mit-3: Creating an arboretum of endemic species inside the airport landscaping

Reduction measure BioT-Mit-4: Transplant remarkable trees and ferns intended to be cut down during the works phase

Offset measure BioT-Comp-6: Action plan towards more sustainable agricultural practices for native biodiversity

Offset measure BioT-Comp-7: Ecological restauration within the limits of the Anse Quitor nature reserve

All these measures are presented in the chapter 7.3.2.1 Terrestrial habitat.

The proposed measures result in a **major severity mitigated impact**. Thus, **The residual impact is of low magnitude**.

7.3.2.2.6 Impact BioT-Flo-W-Def-6: Impact on *Fernelia buxifolia*

7.3.2.2.6.1 Impact before mitigation

The number of specimens inside the project is detailed in the table below.

Sub items	Area/number of specimens inside the area of influence	Area/number of specimens inside the project footprint	Comments
<i>Fernelia buxifolia</i>	2	1	/

The impact is the loss of native trees of a high sensitivity for the island of Rodrigues.

The impact severity is high. Considering the receptor sensitivity assessed as high, the impact magnitude is high.

7.3.2.2.6.2 Mitigation measure and impact after mitigation

Avoidance measure BioT-Av-1: Avoid remarkable trees located at the edge of the project

Reduction measure BioT-Mit-3: Creating an arboretum of endemic species inside the airport landscaping

Offset measure BioT-Comp-6: Action plan towards more sustainable agricultural practices for native biodiversity

Offset measure BioT-Comp-7: Ecological restoration within the limits of the Anse Quitor nature reserve

All these measures are presented in the chapter 7.3.2.1 Terrestrial habitat.

The proposed measures result in a high severity mitigated impact. Thus, The residual impact is of negligible magnitude.

7.3.2.2.7 Impact BioT-Flo-W-Def-7: Impact on *Foetidia rodriguesiana*

7.3.2.2.7.1 Impact before mitigation

The number of specimens inside the project is detailed in the table below.

Sub items	Area/number of specimens inside the area of influence	Area/number of specimens inside the project footprint	Comments
<i>Foetidia rodriguesiana</i>	3	2	50 to 100 specimens in the wild or ex-situ collections

The impact is the loss of native trees of a high sensitivity for the island of Rodrigues.

The impact severity is high. Considering the receptor sensitivity assessed as high, the impact magnitude is high.

7.3.2.2.7.2 Mitigation measure and impact after mitigation

Reduction measure BioT-Mit-3: Creating an arboretum of endemic species inside the airport landscaping

Reduction measure BioT-Mit-4: Transplant remarkable trees and ferns intended to be cut down during the works phase

Offset measure BioT-Comp-6: Action plan towards more sustainable agricultural practices for native biodiversity

Offset measure BioT-Comp-7: Ecological restoration within the limits of the Anse Quitor nature reserve

All these measures are presented in the chapter 7.3.2.1 Terrestrial habitat.

The proposed measures result in a **high severity mitigated impact**. Thus, **The residual impact is of low magnitude**.

7.3.2.2.8 Impact BioT-Flo-W-Def-8: Impact on *Latania verschaffeltii*

7.3.2.2.8.1 Impact before mitigation

The number of specimens inside the project is detailed in the table below.

Sub items	Area/number of specimens inside the area of influence	Area/number of specimens inside the project footprint	Comments
<i>Latania verschaffeltii</i>	10	0	/

The impact is the loss of native trees of a high sensitivity for the island of Rodrigues.

The impact severity is not significant. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is negligible**.

7.3.2.2.8.2 Mitigation measure and impact after mitigation

No measure is necessary.

The proposed measures result in a **not significant severity mitigated impact**. Thus, **The residual impact is of negligible magnitude**.

7.3.2.2.9 Impact BioT-Flo-W-Def-9: Impact on *Terminalia bentzoe* subsp. *Rodriguesensis*

7.3.2.2.9.1 Impact before mitigation

The number of specimens inside the project is detailed in the table below.

Sub items	Area/number of specimens inside the area of influence	Area/number of specimens inside the project footprint	Comments
<i>Terminalia bentzoe</i> subsp. <i>Rodriguesensis</i>	28	3	Reported to be very rare (Mauritius herbarium) but many specimens seem to have been planted around Anse Quitor. The information obtained from wildlife indicates that the number of plants remaining in Rodrigues is about less than fifty.

Sub items	Area/number of specimens inside the area of influence	Area/number of specimens inside the project footprint	Comments
			<p>Their localisation is: Mourouk Valley, Cascade St Louis, St Francois, Anse Ally, English Bay, Pointe Canon, Oyster Bay, Ile Aux Crabes, Plaine Corail, Anse Quitor, Anse Baleine.</p> <p>The main threats to them are development, grazing, hybridization with T.b. bentzoe from Mauritius.</p>

The impact is the loss of native trees of a high sensitivity for the island of Rodrigues.

The **impact severity is high**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is high**.

7.3.2.2.9.2 Mitigation measure and impact after mitigation

Avoidance measure BioT-Av-1: Avoid remarkable trees located at the edge of the project

Avoidance measure BioT-Av-2: Moving the control tower out of the nature reserve

Reduction measure BioT-Mit-3: Creating an arboretum of endemic species inside the airport landscaping

Reduction measure BioT-Mit-4: Transplant remarkable trees and ferns intended to be cut down during the works phase

Reduction measure BioT-Mit-5: Genetic conservation of populations of impacted rare species

Offset measure BioT-Comp-6: Action plan towards more sustainable agricultural practices for native biodiversity

Offset measure BioT-Comp-7: Ecological restauration within the limits of the Anse Quitor nature reserve

All these measures are presented in the chapter 7.3.2.1 Terrestrial habitat.

The proposed measures result in a **high severity mitigated impact**. Thus, **The residual impact is of low magnitude**.

7.3.2.2.10 Impact BioT-Flo-W-Def-10: Impact on *Zanthoxylum paniculatum*

7.3.2.2.10.1 Impact before mitigation

The number of specimens inside the project is detailed in the table below.

Sub items	Area/number of specimens inside the area of influence	Area/number of specimens inside the project footprint	Comments
<i>Zanthoxylum paniculatum</i>	1	0	/

The impact is the loss of native trees of a high sensitivity for the island of Rodrigues.

The impact severity is not significant. Considering the receptor sensitivity assessed as high, the impact magnitude is negligible.

7.3.2.2.10.2 Mitigation measure and impact after mitigation

No measure is necessary.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of negligible magnitude.

7.3.2.2.11 Impact BioT-Flo-W-Def-11: Impact on other native trees with a medium sensitivity for the island of Rodrigues

7.3.2.2.11.1 Impact before mitigation

The species and the number of specimens inside the project are detailed in the table below.

Items	Sub items	Area/number of specimens inside the area of influence	Area/number of specimens inside the project footprint	Comments
Plant species of medium sensitivity: 13 species (in red, species expected to be impacted by the project)	<i>Adiantum rhizophorum</i> , <i>Camptocarpus sphenophyllus</i> , <i>Cyperus iria</i> , <i>Mathurina penduliflora</i> , <i>Nephrolepis biserrata</i> , <i>Pandanus heterocarpus</i> , <i>Paspalidium geminatum</i> , <i>Phymatosorus scolopendria</i> , <i>Pleurostyliya putamen</i> , <i>Rhizophora mucronata</i> , <i>Sarcanthemum coronopus</i> , <i>Secamone rodriguesiana</i> , <i>Tournefortia argentea</i> .	118*	27*	Some of these species will be massively destroyed by the project and are locally protected (<i>Pandanus heterocarpus</i>) Two ferns locally protected (<i>Nephrolepis biserrata</i> / <i>Adiantum rhizophorum</i>)

The impact is the loss of native trees of a medium sensitivity for the island of Rodrigues.

The impact severity is high. Considering the receptor sensitivity assessed as medium, the impact magnitude is medium.

7.3.2.2.11.2 Mitigation measure and impact after mitigation

Avoidance measure BioT-Av-2: Moving the control tower out of the nature reserve

Reduction measure BioT-Mit-3: Creating an arboretum of endemic species inside the airport landscaping

Reduction measure BioT-Mit-4: Transplant remarkable trees and ferns intended to be cut down during the works phase

Reduction measure BioT-Mit-5: Genetic conservation of populations of impacted rare species

Offset measure BioT-Comp-6: Action plan towards more sustainable agricultural practices for native biodiversity

Offset measure BioT-Comp-7: Ecological restoration within the limits of the Anse Quitor nature reserve

All these measures are presented in the chapter 7.3.2.1 Terrestrial habitat.

The proposed measures result in a **high severity mitigated impact**. Thus, **The residual impact is of low magnitude**.

7.3.2.2.12 Impact BioT-Flo-W-Def-12: Impact on other native trees with a low sensitivity for the island of Rodrigues

7.3.2.2.12.1 Impact before mitigation

The species and the number of specimens inside the project are detailed in the table below.

Items	Sub items	Area/number of specimens inside the area of influence	Area/number of specimens inside the project footprint	Comments
Plant species of low sensitivity: 9 species (in red, species expected to be impacted by the project)	<i>Dodonaea viscosa</i> , <i>Dracaena reflexa</i> , <i>Elaeodendron orientale</i> , <i>Ficus reflexa</i> , <i>Ficus rubra</i> , <i>Phyllanthus dumentosus</i> , <i>Premna serratifolia</i> , <i>Sarcostemma viminalis</i> , <i>Thespesia populnea</i>	287*	191*	Some of these species will be massively destroyed by the project and are locally protected (<i>Elaeodendron orientale</i>). One species has become very rare (<i>Phyllanthus dumentosus</i>). For <i>Elaeodendron orientale</i> , the information obtained from wildlife indicates that the number of plants remaining in Rodrigues is about 500 to 1000. They are present in almost all valleys of the island along the coast. The main threat to them is development. For <i>Phyllanthus dumentosus</i> , the information obtained from wildlife indicates that the species is locally common (> 1000 plants). Their localisation is : Ile Aux Cocos, Port Mathurin, possibly other coastal areas. The main threat to them is the development of Port Mathurin.

The impact is the loss of native trees of a low sensitivity for the island of Rodrigues.

The **impact severity is high**. Considering the receptor sensitivity assessed as low, **the impact magnitude is low**.

7.3.2.2.12.2 *Mitigation measure and impact after mitigation*

Avoidance measure BioT-Av-1: Avoid remarkable trees located at the edge of the project

Avoidance measure BioT-Av-2: Moving the control tower out of the nature reserve

Reduction measure BioT-Mit-3: Creating an arboretum of endemic species inside the airport landscaping

Reduction measure BioT-Mit-4: Transplant remarkable trees and ferns intended to be cut down during the works phase

Reduction measure BioT-Mit-5: Genetic conservation of populations of impacted rare species

Offset measure BioT-Comp-6: Action plan towards more sustainable agricultural practices for native biodiversity

Offset measure BioT-Comp-7: Ecological restoration within the limits of the Anse Quitor nature reserve

All these measures are presented in the chapter 7.3.2.1 Terrestrial habitat.

The proposed measures result in a **high severity mitigated impact**. Thus, The residual impact is of **negligible magnitude**.

7.3.2.2.13 Summary

Table 107: Permanent impact during Construction - Biological Environment - Terrestrial Flora

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
BioT-Flo-W-Def-12	Impact on <i>Hyophorbe verschaffeltii</i>	Adverse	High	BioT-Av-1	Avoid remarkable trees located at the edge of the project Targeted species: <i>Antirhea bifurcata</i> , <i>Elaeodendron orientale</i> , <i>Fernelia buxifolia</i> , <i>Hyophorbe verschaffeltii</i> , <i>Terminalia bentzoe subsp. rodriguesensis</i>	Low
				BioT-Mit-3	Creating an arboretum of endemic species inside the airport landscaping	
				BioT-Mit-4	Transplant remarkable trees and ferns intended to be cut down during the works phase	
				BioT-Mit-5	Genetic conservation of populations of impacted rare species : production and reintroduction of clones and genetic ancestors of these species	
				BioT-Comp-6	Action plan towards more sustainable agricultural practices for native biodiversity	
				BioT-Comp-7	Ecological restauration within the limits of the Anse Quito nature reserve	
BioT-Flo-W-Def-2	Impact on <i>Polyscias rodriguesiana</i>	Adverse	Negligible	None	None	Negligible
BioT-Flo-W-Def-3	Impact on <i>Antirhea bifurcata</i>	Adverse	Major	BioT-Av-1	Avoid remarkable trees located at the edge of the project Targeted species: <i>Antirhea bifurcata</i> , <i>Elaeodendron orientale</i> , <i>Fernelia buxifolia</i> , <i>Hyophorbe verschaffeltii</i> , <i>Terminalia bentzoe subsp. rodriguesensis</i>	Low
				BioT-Mit-3	Creating an arboretum of endemic species inside the airport landscaping	
				BioT-Mit-5	Genetic conservation of populations of impacted rare species : production and reintroduction of clones and genetic ancestors of these species	
				BioT-Comp-6	Action plan towards more sustainable agricultural practices for native biodiversity	

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
				BioT-Comp-7	Ecological restauration within the limits of the Anse Quito nature reserve	
BioT-Flo-W-Def-4	<i>Clerodendrum Impact on laciniatum</i>	Adverse	Negligible	None	None	Negligible
BioT-Flo-W-Def-5	<i>Impact on Diospyros diversifolia</i>	Adverse	Major	BioT-Mit-3	Creating an arboretum of endemic species inside the airport landscaping	Low
				BioT-Mit-4	Transplant remarkable trees and ferns intended to be cut down during the works phase	
				BioT-Comp-6	Action plan towards more sustainable agricultural practices for native biodiversity	
				BioT-Comp-7	Ecological restauration within the limits of the Anse Quito nature reserve	
BioT-Flo-W-Def-6	<i>Impact on Fernelia buxifolia</i>	Adverse	High	BioT-Av-1	Avoid remarkable trees located at the edge of the project Targeted species: <i>Antirhea bifurcata</i> , <i>Elaeodendron orientale</i> , <i>Fernelia buxifolia</i> , <i>Hyophorbe verschaffeltii</i> , <i>Terminalia bentzoe subsp. rodriguesensis</i>	Low
				BioT-Mit-3	Creating an arboretum of endemic species inside the airport landscaping	
				BioT-Comp-6	Action plan towards more sustainable agricultural practices for native biodiversity	
				BioT-Comp-7	Ecological restauration within the limits of the Anse Quito nature reserve	
BioT-Flo-W-Def-7	<i>Impact on Foetidia rodriguesiana</i>	Adverse	High	BioT-Mit-3	Creating an arboretum of endemic species inside the airport landscaping	Low
				BioT-Mit-4	Transplant remarkable trees and ferns intended to be cut down during the works phase	
				BioT-Comp-6	Action plan towards more sustainable agricultural practices for native biodiversity.	
				BioT-Comp-7	Ecological restauration within the limits of the Anse Quito nature reserve	

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
BioT-Flo-W-Def-8	<i>Impact on Latania verschaffeltii</i>	Adverse	Negligible	None	None	Negligible
BioT-Flo-W-Def-9	<i>Impact on Terminalia bentzoe subsp. Rodriguesensis</i>	Adverse	High	BioT-Av-1	Avoid remarkable trees located at the edge of the project Targeted species: <i>Antirhea bifurcata</i> , <i>Elaeodendron orientale</i> , <i>Fernelia buxifolia</i> , <i>Hyophorbe verschaffeltii</i> , <i>Terminalia bentzoe subsp. rodriguesensis</i>	Low
				BioT-Av-2	Moving the control tower out of the nature reserve	
				BioT-Mit-3	Creating an arboretum of endemic species inside the airport landscaping	
				BioT-Mit-4	Transplant remarkable trees and ferns intended to be cut down during the works phase	
				BioT-Mit-5	Genetic conservation of populations of impacted rare species	
				BioT-Comp-6	Action plan towards more sustainable agricultural practices for native biodiversity	
				BioT-Comp-7	Ecological restoration within the limits of the Anse Quitor nature reserve	
BioT-Flo-W-Def-10	<i>Impact on Zanthoxylum paniculatum</i>	Adverse	Negligible	None	None	Negligible
BioT-Flo-W-Def-11	<i>Impact on plant species with medium sensitivity: Adiantum rhizophorum, Camptocarpus sphenophyllus, Cyperus iria, Mathurina</i>	Adverse	Medium	BioT-Av-2	Moving the control tower out of the nature reserve	Low
				BioT-Mit-3	Creating an arboretum of endemic species inside the airport landscaping	

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
	<i>penduliflora</i> , <i>Nephrolepis biserrata</i> , <i>Pandanus heterocarpus</i> , <i>Paspalidium geminatum</i> , <i>Phymatosorus scolopendria</i> , <i>Pleurostyliya putamen</i> , <i>Rhizophora mucronata</i> , <i>Sarcanthemum coronopus</i> , <i>Secamone rodriguesiana</i> , <i>Tournefortia argentea</i> .			BioT-Mit-4	Transplant remarkable trees and ferns intended to be cut down during the works phase	
				BioT-Mit-5	Genetic conservation of populations of impacted rare species	
				BioT-Comp-6	Action plan towards more sustainable agricultural practices for native biodiversity.	
				BioT-Comp-7	Ecological restauration within the limits of the Anse Quitor nature reserve	
BioT-Flo-W-Def-12	<i>Impact on plant species with low sensitivity :</i> <i>Dodonaea viscosa</i> , <i>Dracaena reflexa</i> , <i>Elaeodendron orientale</i> , <i>Ficus reflexa</i> , <i>Ficus rubra</i> , <i>Phyllanthus dumentosus</i> , <i>Premna serratifolia</i> , <i>Sarcostemma</i>	Adverse	Low	BioT-Av-1	Avoid remarkable trees located at the edge of the project Targeted species: <i>Antirhea bifurcata</i> , <i>Elaeodendron orientale</i> , <i>Fernelia buxifolia</i> , <i>Hyophorbe verschaffeltii</i> , <i>Terminalia bentzoe subsp. rodriguesensis</i>	Low
				BioT-Av-2	Moving the control tower out of the nature reserve	
				BioT-Mit-3	Creating an arboretum of endemic species inside the airport landscaping	
				BioT-Mit-4	Transplant remarkable trees and ferns intended to be cut down during the works phase	

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
	<i>viminale</i> , <i>Thespesia populnea</i>			BioT-Mit-5	Genetic conservation of populations of impacted rare species	

*refers to non-exhaustive counts

7.3.2.3 Terrestrial fauna

Loss of the vegetation cover from the site will result in the loss of habitat for a range of species and will reduce the ecosystem services provided. Ecosystem services particularly affected will be retention of soil, sediment control, water retention and gradual release.

Based on qualitative field observations completed during the field campaigns, the area within the proposed airstrip extension appears unlikely to support ecologically significant Rodrigues bird and reptile species. It is likely that isolated indigenous faunal species (e.g. *Lygodactylus lugubris*) do exist within the limits of the project footprint; however, the presence of these individuals in numbers that would be considered a viable community is considered unlikely. Species such as *Tropidophora ssp.* are widely present in the area of influence and the "endangered" status of *Tropidophora articulata* makes it a particularly sensitive point here. The impacts of the destruction of individuals of these 2 species could be important without mitigation measures.

The impact sensitivity and magnitude are exposed below.

The overall impact magnitude on native fauna loss is assessed at medium level.

7.3.2.3.1 Impact BioT-Fau-W-Def-1: Impact on *Pteropus rodricensis* (Chiroptera)

7.3.2.3.1.1 Impact before mitigation

For this species, the number of specimens inside the area of influence is higher than 10, and the number of specimens inside the project footprint is considered 0.

The dry forest sectors favourable to *Pteropus rodricensis* around the area of influence cover an area of about 17.5 ha but will not be challenged by the project.

The impact is the loss of semi-natural vegetation and some ecosystem functions.

The impact severity is low. Considering the receptor sensitivity assessed as low, **the impact magnitude is low.**

7.3.2.3.1.2 Mitigation measure and impact after mitigation

No measure is necessary.

The proposed measures result in a low severity mitigated impact. Thus, **The residual impact is of low magnitude.**

7.3.2.3.2 Impact BioT-Fau-W-Def-2: Impact on *Tropidophora articulata* (Gastropoda)

7.3.2.3.2.1 Impact before mitigation

For this species, the number of specimens inside the area of influence or inside the project footprint is unknown. The impact is the loss of native gasteropoda individuals and their foraging habitat. However, only empty shells were found on the site.

The impact severity is high. Considering the receptor sensitivity assessed as medium to high, **the impact magnitude is medium to high.**

7.3.2.3.2.2 Mitigation measure and impact after mitigation

Reduction measure BioT-Mit-8: Collect arthropods from the *Tropiphodora* genus before and during earthwork

This measure consists in collecting living individuals of *Tropiphodora* within the project footprint boundaries.

Several campaigns will be conducted before the works phase and during earthwork. Sampling planning will allow the entire project area to be visited in an equivalent manner. If species are more abundant in some areas, these areas will be collected more thoroughly.



Implementation conditions / Points of vigilance : Learn how to distinguish the two different species recorded on site.

The responsible person or structure for this measure could be the contractor or ARL, and the potential partners: Vincent Florens (Department of Biosciences, University of Mauritius, Réduit, Mauritius).

The proposed measures result in a high severity mitigated impact. Thus, The residual impact is of low magnitude.

7.3.2.3.3 Impact BioT-Fau-W-Def-3: Impact on *Tropidophora eugeniae* (Gastropoda)

7.3.2.3.3.1 Impact before mitigation

For this species, the number of specimens inside the area of influence or inside the project footprint is unknown. The impact is the loss of native gastropoda individuals and their foraging habitat.

The impact severity is high. Considering the receptor sensitivity assessed as low, the impact magnitude is low.

7.3.2.3.3.2 Mitigation measure and impact after mitigation

No measure is necessary.

The proposed measures result in a high severity mitigated impact. Thus, The residual impact is of low magnitude.

7.3.2.3.4 Impact BioT-Fau-W-Def-4: Impact on *Lygodactylus lugubris* (Reptilia)

7.3.2.3.4.1 Impact before mitigation

For this species, the number of specimens inside the area of influence or inside the project footprint is unknown (at least 3).



Figure 177: Isolated *Lygodactylus lugubris* on a *Latania vershaffeltii* near the airport

The impact is the loss of semi-natural vegetation and some ecosystem functions.

The impact severity is low. Considering the receptor sensitivity assessed as low, **the impact magnitude is low.**

7.3.2.3.4.2 Mitigation measure and impact after mitigation

No measure is necessary.

The proposed measures result in a low severity mitigated impact. Thus, **The residual impact is of low magnitude.**

7.3.2.3.5 Summary

Table 108: Permanent impact during Construction - Biological Environment - Terrestrial Fauna

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
BioT-Fau-W-Def-1	Impact on <i>Pteropus rodricensis</i> (Chiroptera)	Adverse	Low	None	None	Low
BioT-Fau-W-Def-2	Impact on <i>Tropidophora articulata</i> (Gastropoda)	Adverse	Medium/High	BioT-Mit-8	Collect arthropods from the Tropiphodora genus before and during earthwork	Low
BioT-Fau-W-Def-3	Impact on <i>Tropidophora eugeniae</i> (Gastropoda)	Adverse	Low	None	None	Low
BioT-Fau-W-Def-4	Impact on <i>Lygodactylus lugubris</i> (Reptilia)	Adverse	Low	None	None	Low

7.3.2.4 Marine habitats

The main potential direct impacts on marine ecology in the works phase are the:

- Destruction of natural habitats and associated species;
- Modification of the physical functioning of habitats induced by the facilities (hydrosedimentary modification, current change...).

The construction works (backfilling at sea for the construction of the new runway and the boat house and jetty facilities) are the primary potential source of these potential impacts.

7.3.2.4.1 Impact BioM-Hab-W-Def-1: Destruction of natural habitats

7.3.2.4.1.1 Impact before mitigation

All marine habitats and species in the footprint of offshore embankment will be lost through the new runway construction (total marine right-of-way of 24112 m²).

Among the habitats inventoried in July 2019, this represents a habitat loss of :

- 1391m² for the lagoon sedimentary plain, sandy facies (stations 20 at 22 and 40);
- 22721 m² for the sublittoral rocks dominated by photophilic algae (stations 11 at 14, 23 and 51).

These habitats remain widely represented on an island scale. The shallow rocky areas facilitate the development of some isolated coral colonies (*Acropora formosa*, *Porites* sp.) in the whole stations (stations n°11 to n°14) with many associated mobile species but with a weak species richness (*Epinephelus merra*, *Gymnothorax griseus*, *Cheilodipterus quinquelineatus*, *Ostracion cubicus* for fishes).



Figure 178: Isolated coral colonies with *Acropora formosa* at station n°12 (on the left) and *Porites* sp. at station n°13 (on the right)

The impact severity is high. Considering the receptor sensitivity assessed as high (coral reef), the impact magnitude is high.

7.3.2.4.1.2 Mitigation measure and impact after mitigation

As the magnitude is high, a mitigation measure is proposed.

Avoidance measure (BioM-Av-3): Avoid coral heads located at the edge of the project

This measure consists in avoiding the destruction of isolated coral colonies located at the boundaries of the project footprint. Thus, it is proposed to identify and mark out all the coral heads located in the maritime right-of-way of the future runway.

If feasible, the corals will be moved to the South East Marine Protected Area (SEMPA).

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of low magnitude.

The rating may be revised based on final design and method statements.

7.3.2.4.2 Impact BioM-Hab-W-Def-2: Modification of the physical functioning of habitats

7.3.2.4.2.1 Impact before mitigation

The developments of the project at sea will induce discharges into the marine environment, ie hydrosedimentary modification, current change. These changes are not significant for the project.

The impact severity is not significant. Considering the receptor sensitivity assessed as low the impact magnitude is negligible.

7.3.2.4.2.2 Mitigation measure and impact after mitigation

No mitigation measure is proposed.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of negligible magnitude.

7.3.2.4.3 Summary

Table 109: Permanent impact during Construction - Biological Environment - Marine Habitats

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
BioM-Hab-W-Def-1:	Destruction of natural habitats including areas characterized by presence of <i>Acropora formosa</i>	Adverse	High	BioM-Av-3	Avoid coral heads located at the edge of the project Relocate corals in the SEMPA if feasible	Low
BioM-Hab-W-Def-2:	Modification of the physical functioning of habitats	Adverse	Negligible	none	-	-

7.3.2.5 Marine species

The main potential impact on marine species in the marine works phase is the destruction of marine species.

7.3.2.5.1 Impact BioM-Spe-W-Def-1: impact on soft bottom species

7.3.2.5.1.1 Impact before mitigation

Topaze Bay is dominated by a mixed soft substrate, which locally shelters seagrass and macroalgae. This type of habitat remains important in Rodrigues's lagoon (about 30%). This environment is the habitat of common species, dominated by echinoderms (holothurians, sea urchins...), other small invertebrates (annelids...) or fish (herbivores or eaters of small invertebrates).

The impact severity is low. Considering the receptor sensitivity assessed as low, the impact magnitude is low.

7.3.2.5.1.2 Mitigation measure and impact after mitigation

No mitigation measure is proposed.

7.3.2.5.2 Impact BioM-Spe-W-Def-2: impact on mobile species

7.3.2.5.2.1 Impact before mitigation

However, mobile species (ichthyofauna, marine mammals, marine turtles) have the ability to avoid these exposures by maintaining a certain distance from overly turbid waters and/or areas of works that are too noisy.

The species present around the settlement area and further along the coast are adapted to the usual variations in turbidity and noise in the area (natural conditions, fishing gear, etc.).

The impact severity is low. Considering the receptor sensitivity assessed as low (ichthyofauna and marine mammals) and high (marine turtles), the impact magnitude is low.

7.3.2.5.2.2 Mitigation measure and impact after mitigation

No mitigation measure is proposed.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of low magnitude.

7.3.2.5.3 Summary

Table 110: Permanent impact during Construction - Biological Environment - Marine Species

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
BioM-Spe-W-Def-1	Impact on soft bottom species	Adverse	Low	none	-	Low
BioM-Spe-W-Def-2	Impact on mobile species	Adverse	Low	none	-	Low

7.3.3 Transport network, electricity supply and waste management

No permanent and irreversible impacts during Construction Phase.

7.3.4 Socio-economic environment

7.3.4.1 Impacts on demographics and social dynamics

7.3.4.1.1 Impact SE-Demo-W-Def-1: Physical displacement of the population affected by the project

Source of the impact: Construction of the runway and airport infrastructures

7.3.4.1.1.1 Impact before mitigation

The construction of the runway and the infrastructure of the airport will cause the involuntary displacement of the inhabitants of the village of Sainte Marie.

This impact will have consequences on lifestyles related to proper practices in particular in relation to agricultural and livestock breeding activities.

The project will inevitably and irreversibly lead to change in this specific lifestyle and the necessary adaptation in the resettlement area.

The inhabitants of Sainte Marie, as well as those of the resettlement location, are high-sensitivity receptors because they will have to be discerning as to the proper organisation of social relations and particularly with regard to good integration of agro-pastoral systems.

The **impact severity is major**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is major**.

7.3.4.1.1.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a Resettlement Action Plan (RAP) that respects the commitments to relocate and restore livelihoods and complies with IFC standards. (Measure SE-Comp-1):
- Organize information meetings at the level of the towns affected by the project
- Use an effective and transparent complaint management mechanism at project level and communicate this mechanism to the authorities and towns impacted by the project activities
- Conduct consultations with potentially impacted villages to prepare for the implementation of the Resettlement Action Plan
- Establish a complaint management mechanism that is widely known to local stakeholders (local authorities and populations affected directly or indirectly by the project) and works in an efficient and transparent manner
- Ensure that the implementation of the Resettlement Action Plan (RAP) is in line with the project's commitments for the resettlement and restoration of livelihoods and IFC standards
- Clarify the delimitation of land boundaries and right-holders prior to the compensation process
- Compensate land and infrastructure on the basis of a plan to manage individual and community compensation by land as much as possible, cover losses incurred for both individuals and the community

- Develop a Livelihood Restoration Plan for communities that will be affected by "economic displacement" (loss of property and/or livelihoods) and establish a monitoring-assessment program of the socio-economic conditions of displaced people
- Compensate for all farmland affected by the project, cover losses incurred on the basis of the economic reality of the study area, both for individual and community right holders
- Integrate compensation mechanisms for impacted livestock breeders
- Integrate compensation mechanisms for fishermen impacted by the activities of the project
- Search for land to accommodate physically displaced people and organise relocation
- Replace any social infrastructure that will be destroyed or the method of operation of which will be altered by the project
- Create a Resettlement Monitoring Committee for helping the follow up and ensuring the proceedings of activities and procedures
- Propose, to the extent possible, replacement farmland permitting displaced populations to have sustainable livelihoods. (Measure SE-Comp-2):
- Clarify the delimitation of land boundaries and right-holders prior to the compensation process
- Conduct consultations with potentially impacted villages to prepare for the implementation of the Resettlement Action Plan
- Organize restitution of farmland areas to the communities of the towns
- Compensate land and infrastructure on the basis of a plan to manage individual and community compensation by land as much as possible, cover losses incurred for both individuals and the community
- Develop a Livelihood Restoration Plan for communities that will be affected by "economic displacement" (loss of property and/or livelihoods) and establish a monitoring-assessment program of the socio-economic conditions of displaced people
- Support the diversification of income-generating economic activities in the context of the Livelihood Restoration Plan so that people affected by the project can regain sustainable livelihoods and possibly invest in these activities a part of the financial indemnifications resulting from the RAP
- Compensate for all farmland affected by the project, cover losses incurred on the basis of the economic reality of the study area, both for individual and community right holders
- Search for, to the extent possible, replacement farmland to permit displaced populations to have sustainable livelihoods
- Create a Resettlement Monitoring Committee for helping the follow up and ensuring the proceedings of activities and procedures
- Implement a communication plan (including complaint management) and internal support for all displaced residents and those in the towns of the proposed relocation areas. (Measure SE-Mit-3 – see 7.2.4.2.1.2)

These mitigation measures will limit the magnitude of the impact to a medium level as relocation may remain a disturbance until a full adaptation of displaced population as well as host population.

The proposed measures result in a **major severity mitigated impact**. Thus, **The residual impact is of medium magnitude**.

7.3.4.1.2 Impact SE-Demo-W-Def-2: Involuntary economic and physical displacement of the active and non-resident population affected by the project

Source of the impact: Construction of the runway and airport infrastructures

7.3.4.1.2.1 Impact before mitigation

The construction of the runway will also induce involuntary displacement of the active and non-resident population of the area. This impact will focus on livestock breeders and fishermen in the area who have to adapt to new social conditions for managing their activities.

The project will irreversibly lead to the displacement of the fishing infrastructures and that of the herds of the livestock breeders, which must find new grazing areas.

This impact will have significant consequences for fishermen and especially livestock breeders whose sensitivity is related to the availability of pasture surfaces.

The impact severity is major. Considering the receptor sensitivity assessed as major the impact magnitude is major.

7.3.4.1.2.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a Resettlement Action Plan (RAP) that respects the commitments to relocate and restore livelihoods and complies with IFC standards. (Measure SE-Comp-1 – see 7.3.4.1.1.2)
- Propose, to the extent possible, pasture and alternative fishing facilities to permit displaced populations to have sustainable livelihoods. (Measure SE-Comp-4):
- Clarify the delimitation of land boundaries and right-holders prior to the compensation process
- Conduct consultations with potentially impacted villages to prepare for the implementation of the Resettlement Action Plan
- Organize restitution of farmland areas to the communities of the towns
- Compensate land and infrastructure on the basis of a plan to manage individual and community compensation by land as much as possible, cover losses incurred for both individuals and the community
- Develop a Livelihood Restoration Plan for communities that will be affected by "economic displacement" (loss of property and/or livelihoods) and establish a monitoring-assessment program of the socio-economic conditions of displaced people
- Support the diversification of income-generating economic activities in the context of the Livelihood Restoration Plan so that people affected by the project can regain sustainable livelihoods and possibly invest in these activities a part of the financial indemnifications resulting from the RAP
- Integrate compensation mechanisms for impacted livestock breeders
- Integrate compensation mechanisms for fishermen impacted by the activities of the project
- Search for land to accommodate physically displaced people and organise relocation
- Implement a communication plan (including complaint management) and internal support for all displaced residents and those in the towns of the proposed relocation areas. (Measure SE-Mit-3 – see 7.2.4.2.1.2)



These mitigation measures will permit the limitation of the magnitude of the impact to a medium level as relocation may remain a disturbance until full adaptation of displaced as well as host population.

The proposed measures result in a **major severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

7.3.4.1.3 Summary

Table 111: Permanent impact during Construction - Socio-Economic Environment - Demographics & Social Dynamics

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Demo-W-Def-1	Physical and economic involuntary displacement of active and non-resident population affected by the project	Adverse	Major	SE-Comp-1	Compensation - Resettlement Action Plan (RAP).	Medium
				SE-Comp-2	Compensation - Availability of farmland.	
				SE-Mit-3	Mitigation - Communication plan, complaint management and internal support for relocation.	
SE-Demo-W-Def-2	Physical and economic involuntary displacement of active and non-resident population affected by the project	Adverse	Major	SE-Comp-1	Compensation - Resettlement Action Plan (RAP).	Medium
				SE-Comp-4	Compensation - Provision of pasture areas and new fishing infrastructures.	
				SE-Mit-3	Mitigation - Communication plan, complaint management and internal support for relocation.	

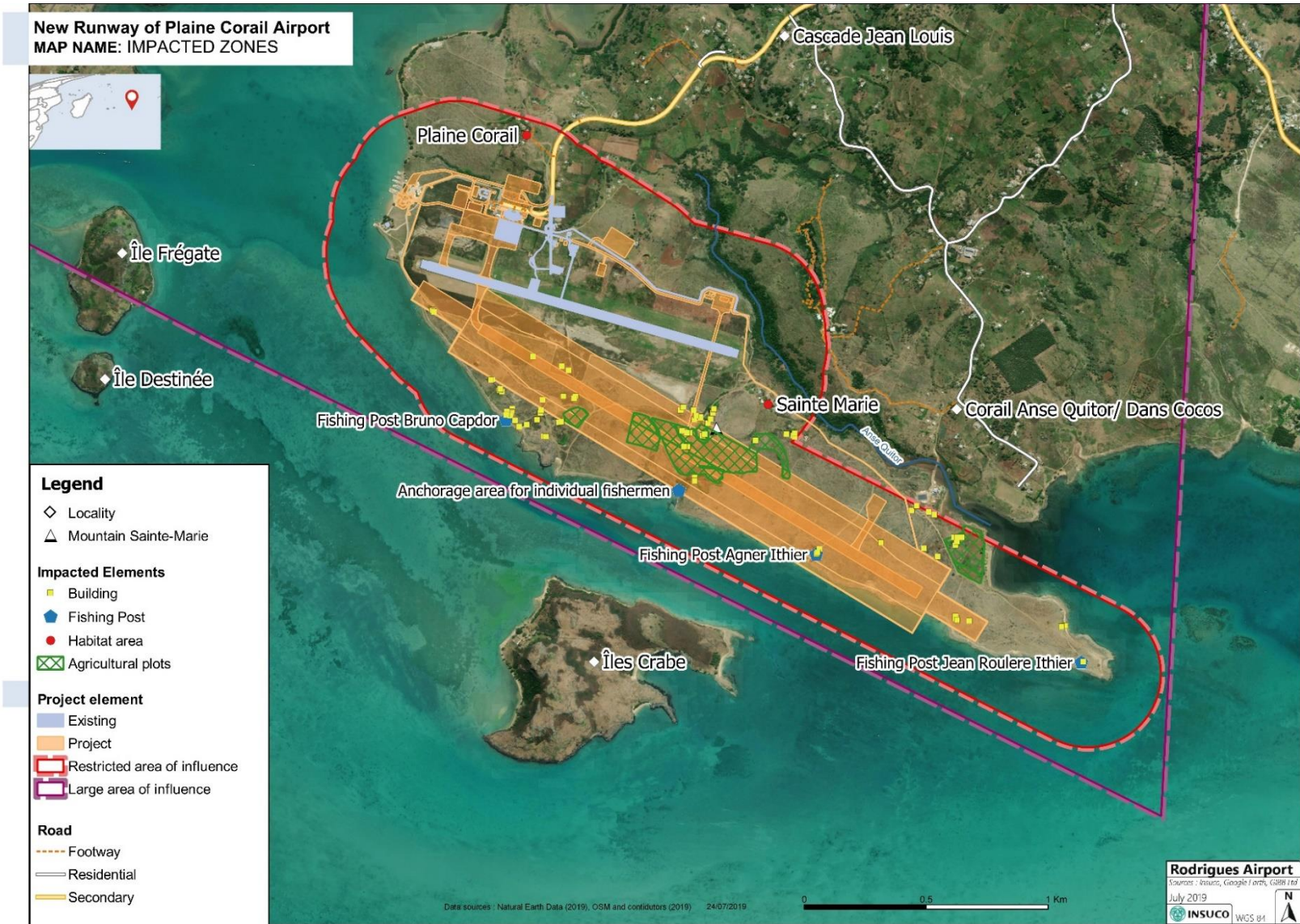


Figure 179: Impact lands and buildings

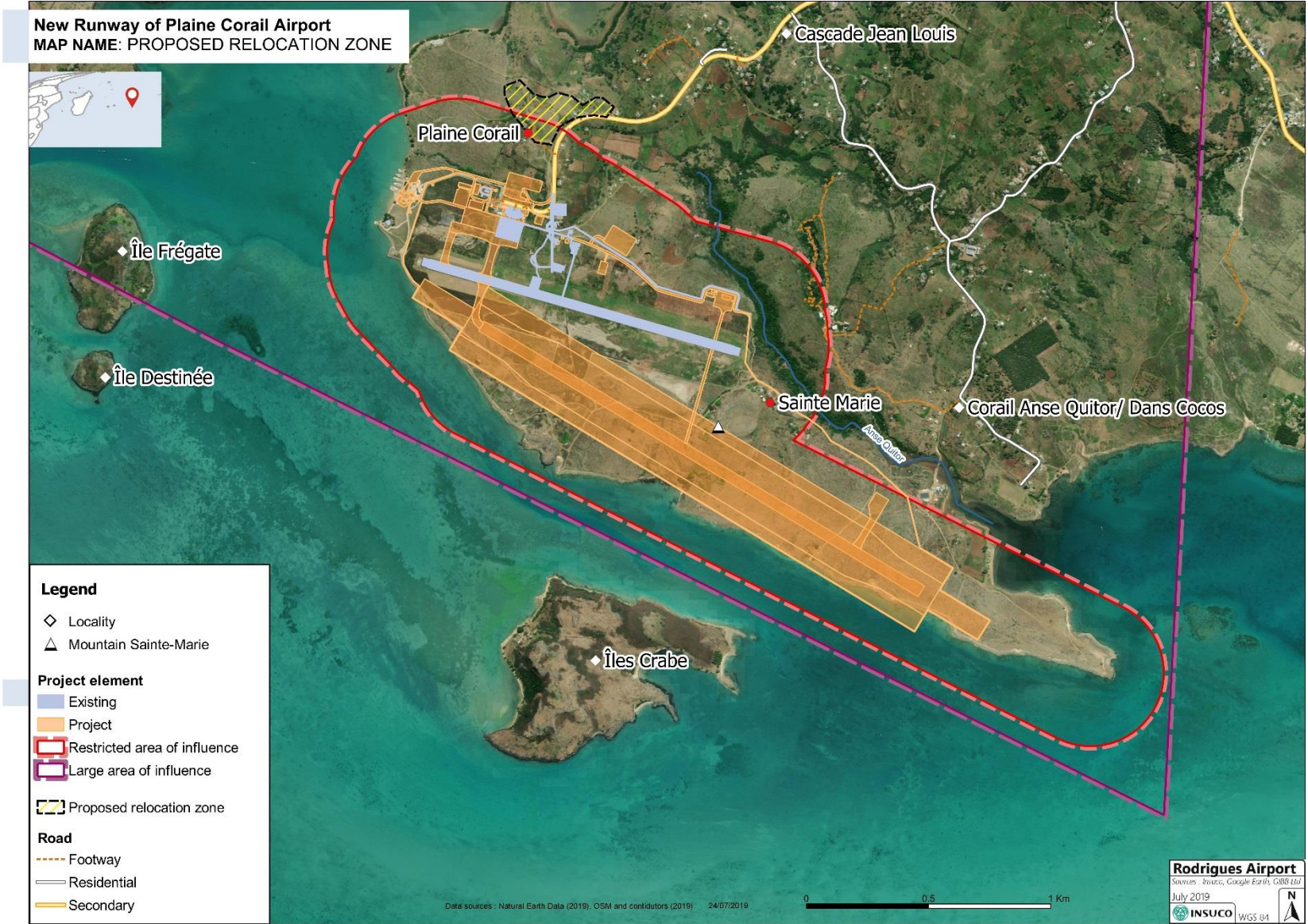


Figure 180: Proposed habitations relocation zone

7.3.4.2 Impacts on land

7.3.4.2.1 Impact SE-Land-W-Def-1: Loss of houses or infrastructure due to involuntary displacement of the population affected by the project

Source of the impact: Construction of the runway and airport infrastructures

7.3.4.2.1.1 Impact before mitigation

The Sainte Marie villagers as well as users of the impacted area are irreversibly affected by the loss of their homes, various infrastructures and land that they have known throughout their lives. Village houses as well as fishing infrastructures have sentimental value and some people feel that these houses built in coral blocks are stronger than those of today.

Affected communities are therefore very sensitive to infrastructural and land loss, which is obviously a major impact.

The impact severity is major. Considering the receptor sensitivity assessed as major, the impact magnitude is major.

7.3.4.2.1.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a Resettlement Action Plan (RAP) that respects the commitments to relocate and restore livelihoods and complies with IFC standards. (Measure SE-Comp-1 – see 7.3.4.1.1.2)
- Propose, to the extent possible, replacement farmland permitting displaced populations to have sustainable livelihoods. (Measure SE-Comp-2 – see 7.3.4.1.1.2)
- Implement a communication plan (including complaint management) and internal support for all displaced residents and those in the towns of the proposed relocation areas. (Measure SE-Mit-3 – see 7.2.4.2.1.2)

These mitigation measures will limit the magnitude of the impact to a medium level as displaced inhabitant may retrieve new houses built in cement blocks.

The proposed measures result in a major severity mitigated impact. Thus, The residual impact is of medium magnitude.

7.3.4.2.2 Summary

Table 112: Permanent impact during Construction - Socio-Economic Environment - Land

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Land-W-Def-1	Loss of habitats or infrastructures used due to involuntary displacement of the affected population	Adverse	Major	SE-Comp-1	Compensation - Resettlement Action Plan (RAP).	Medium
				SE-Comp-2	Compensation - Availability of farmland.	
				SE-Mit-3	Mitigation - Communication plan, complaint management and internal support for relocation.	

7.3.4.3 Impacts on agriculture and livestock

7.3.4.3.1 Impact SE-Agri-W-Def-1: Loss of farmland and pasture in the construction area

Source of the impact: Construction of the runway and airport infrastructures

7.3.4.3.1.1 Impact before mitigation

This direct impact concerns the Sainte Marie village community and that of the Bangélique area livestock breeders. They currently use the area for extensive grazing of their herds as well as to produce vegetables and other annual plants in fields near their homes.

The project will inevitably and irreversibly lead to the loss of fields and grazing areas.

The Sainte Marie inhabitants (and to a lesser extent the non-resident Bangélique livestock breeders) are highly sensitive receptors for this impact because their socio-economic functioning system is mainly based on agriculture and livestock breeding practices.

The **impact severity is major**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is major**.

7.3.4.3.1.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a Resettlement Action Plan (RAP) that respects the commitments to relocate and restore livelihoods and complies with IFC standards. (Measure SE-Comp-1 – see 7.3.4.1.1.2)
- Propose, to the extent possible, replacement farmland permitting displaced populations to have sustainable livelihoods. (Measure SE-Comp-2 – see 7.3.4.1.1.2)
- Propose a plan monitoring agricultural and livestock breeding communities facilitating the integration of significantly different agricultural and livestock breeding methods. (Measure SE-Mit-9 – see 7.2.4.3.2.2)
- These mitigation measures will limit the magnitude of the impact to a medium level as farmland and pastures will remain an important concern for the villagers.

The proposed measures result in a **major severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

7.3.4.3.2 Impact SE-Agri-W-Def-2: Loss of perennial crops

Source of the impact: Construction of the runway and airport infrastructures

7.3.4.3.2.1 Impact before mitigation

This direct impact concerns only the Sainte Marie village community. Within their fields and surrounding their homes, the Sainte Marie inhabitants have planted fruit trees bringing them seasonal fruit production.

The project will inevitably and irreversibly lead to the loss of these perennial crops.

The Sainte Marie inhabitants are receptors that are rather sensitive to this impact for the fact that fruit trees take some time to bring back their fruits and constitute a form of investment over

time. The fruit production in Sainte Marie is most often presented as a very popular pleasure plant.

The **impact severity is major**. Considering the **receptor sensitivity assessed as medium**, **the impact magnitude is high**.

7.3.4.3.2.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a Resettlement Action Plan (RAP) that respects the commitments to relocate and restore livelihoods and complies with IFC standards. (Measure SE-Comp-1 – see 7.3.4.1.1.2)

These mitigation measures will limit the magnitude of the impact to a medium level as perennial crops represent an appreciated component of local farmlands.

The proposed measures result in a **major severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

7.3.4.3.3 Impact SE-Agri-W-Def-3: Loss of farmland (cumulative impact)

Source of the impact: Involuntary displacement of the populations affected by the project.

7.3.4.3.3.1 Impact before mitigation

The loss of farmland only concerns the Sainte Marie community. These lands have been enriched over the years by the Sainte Marie inhabitants who then made production of annual plants possible because of their agriculture/livestock association methods.

The relocation of the Sainte Marie inhabitants will inevitably lead to the need to rehabilitate soils in order to make them more fertile.

If agricultural productions do not represent the main activity of the inhabitants of Sainte Marie, they are an integral part of their socio-economic functioning and thus represent a considerable stake.

The **impact severity is high**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is major**.

7.3.4.3.3.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a Resettlement Action Plan (RAP) that respects the commitments to relocate and restore livelihoods and complies with IFC standards. (Measure SE-Comp-1 – see 7.3.4.1.1.2)
- Propose, to the extent possible, replacement farmland permitting displaced populations to have sustainable livelihoods. (Measure SE-Comp-2 – see 7.3.4.1.1.2)
- Propose a plan to monitor agricultural and livestock breeding communities facilitating the integration of significantly different agricultural and livestock breeding methods. (Measure SE-Mit-9 – see 7.2.4.3.2.2)

These mitigation measures will limit the magnitude of the impact to a medium level as farmlands are a main socio-economic component.

The proposed measures result in a **high severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

7.3.4.3.4 Impact SE-Agri-W-Def-4: Change in animal husbandry and agricultural practices (cumulative impact)

Source of the impact: Loss of farmland

7.3.4.3.4.1 Impact before mitigation

This will directly impact the Sainte Marie village community, the Bangélique livestock breeders but also the farmers/livestock breeders in the proposed relocation area. The total number of animals accounted for by all affected people can become sizeable in the same area.

The currently very extensive grazing procedures in the construction area will most likely have to evolve in such a way as to remain viable. Likewise for the plantations, resettled people will probably not be able to keep the farm activity close to home.

The issues for the populations mentioned here are paramount. The sensitivity of these issues is therefore major, because their socio-economic operational system is mainly based on agriculture and livestock breeding practices.

The **impact severity is medium**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is high**.

7.3.4.3.4.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement support measures in terms of agricultural techniques and practices and possibly measures of community financial support during their period of adaptation and integration into their new environment. (Measure SE-Mit-9 – see 7.2.4.3.2.2)
- Establish a visit and consultation timetable for the communities in regard to specific integration topics of the displaced herds in their new environment and the evolution of the agro-pastoral system. (Measure SE-Mit-11 – see 7.2.4.4.2.2)

These mitigation measures limit the magnitude of the impact to a low level.

The proposed measures result in a **medium severity mitigated impact**. Thus, **the residual impact is of low magnitude**.

7.3.4.3.5 Summary

Table 113: Permanent impact during Construction - Socio-Economic Environment - Agriculture & Livestock

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Agri-W-Def-1	Loss of farmland and pasture in the construction area	Adverse	Major	SE-Comp-1	Compensation - Resettlement Action Plan (RAP).	Medium
				SE-Comp-2	Compensation - Availability of farmland.	
				SE-Mit-9	Mitigation - Agricultural technical support plan.	
SE-Agri-W-Def-2	Loss of perennial crops	Adverse	High	SE-Comp-1	Compensation - Resettlement Action Plan (RAP).	Medium
SE-Agri-W-Def-3	Loss of farmland	Adverse	High	SE-Comp-1	Compensation - Resettlement Action Plan (RAP).	Medium
				SE-Comp-2	Compensation - Availability of farmland.	
				SE-Mit-9	Mitigation - Agricultural technical support plan.	
SE-Agri-W-Def-4	Change in animal husbandry and agricultural practices	Adverse	High	SE-Mit-9	Mitigation - Agricultural technical support plan.	Low
				SE-Mit-11	Mitigation - Community consultation plan for monitoring the evolution of the agro-pastoral system.	

7.3.4.4 Impacts on fishing

7.3.4.4.1 Impact SE-Fish-W-Def-1: Loss of direct access to the fishermen landing sites

Source of the impact: Construction of the runway and airport infrastructures

7.3.4.4.1.1 Impact before mitigation

The communities directly impacted are some Sainte Marie individual fishermen as well as non-resident fishermen currently using fishing posts for their main activity of drag net fishing.

The project will inevitably and irreversibly lead to the inaccessibility to the water.

Fishing is an integral part of the socio-economic model of these communities, which is a major issue for a highly sensitive receptor population.

The **impact severity is major**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is major**.

7.3.4.4.1.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a Resettlement Action Plan (RAP) that respects the commitments to relocate and restore livelihoods and complies with IFC standards. (Measure SE-Comp-1 – see 7.3.4.1.1.2)
- Establish a monitoring and consultation plan for fishing communities considering their possible grievances due to the inaccessibility to the fishermen landing sites. (Measure SE-Mit-13):
- Organize information meetings at the level of the towns affected by the project
- Use an effective and transparent complaint management mechanism at project level and communicate this mechanism to the authorities and towns impacted by the project activities
- Develop and adopt a continuous and transparent communication strategy concerning the issues of displacement and relocation
- Establish a complaint management mechanism that is widely known to local stakeholders (local authorities and populations affected directly or indirectly by the project) and works in an efficient and transparent manner

These mitigation measures will limit the magnitude of the impact to a medium level as fishing still remains a sensitive element for locals.

The proposed measures result in a **major severity mitigated impact**. Thus, **The residual impact is of medium magnitude**.

7.3.4.4.2 Impact SE-Fish-W-Def-2: Loss of fishing infrastructures

Source of the impact: Construction of the runway and airport infrastructures

7.3.4.4.2.1 Impact before mitigation

The sites in the airport area will directly impact the community of non-resident fishermen who use fishing posts as fishing infrastructures.

The project will irreversibly lead to the destruction of these infrastructures.

For fishermen's communities, this is a major impact on their main activity and source of income.

The **impact severity is major**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is major**.

7.3.4.4.2.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a Resettlement Action Plan (RAP) that respects the commitments to relocate and restore livelihoods and complies with IFC standards. (Measure SE-Comp-1 – see 7.3.4.1.1.2)
- Establish a monitoring and consultation plan for fishing communities considering their possible grievances to ensure that the changes imposed do not negatively affect the results of the fishery. (Measure SE-Mit-13 – see 7.3.4.4.1.2)

These mitigation measures will limit the magnitude of the impact to a low level.

The proposed measures result in a **major severity mitigated impact**. Thus, **The residual impact is of low magnitude**.

7.3.4.4.3 Impact SE-Fish-W-Def-3: Increased distances and travel times to fishermen landing sites

Source of the impact: Involuntary displacement of the populations affected by the project

7.3.4.4.3.1 Impact before mitigation

The displacement of the inhabitants and the fishing communities also implies a modification of the distances to reach the new fishermen landing sites. Some fishermen will probably encounter longer travel distances to their boat's mooring site.

The increase can affect the fishing times and therefore their incomes.

The **impact severity is medium**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is medium**.

7.3.4.4.3.2 Mitigation measures and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a Resettlement Action Plan (RAP) that respects the commitments to relocate and restore livelihoods and complies with IFC standards. (Measure SE-Comp-1 – see 7.3.4.1.1.2)
- Establish a monitoring and consultation plan for fishing communities considering their possible grievances to ensure that the changes imposed do not negatively affect the results of the fisheries and permit the proposal of solutions. (Measure SE-Mit-13 – see 7.3.4.4.1.2)

These mitigation measures will limit the magnitude of the impact to a low level.

The proposed measures result in a **medium severity mitigated impact**. Thus, **the residual impact is of low magnitude**.

7.3.4.4.4 Impact SE-Fish-W-Def-4: Increased time and distance to preferred fishing areas (cumulative impact)

Source of the impact: Loss of direct access to the sea

7.3.4.4.1 *Impact before mitigation*

Relocation of fishermen from the impacted area will irrevocably imply an increase in the distance and navigation time from the mooring site to the usual fishing areas. In addition to this, motorised navigation may be necessary and therefore will have a sizeable impact on the costs of the activity.

Therefore, the sensitivity of the fishermen of Sainte Marie and Bangélique can be described as high.

The **impact severity is high**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is high**.

7.3.4.4.2 *Mitigation measures and impact after mitigation*

To mitigate this impact, it is proposed to:

- Ensure the follow-up and proper establishment of the Resettlement Action Plan (RAP) respecting the resettlement and livelihood restoration commitments and complying with IFC standards. (Measure SE-Mit-10 – see 7.2.4.4.1.2)
- Establish a monitoring and consultation plan for fishing communities considering their possible grievances to ensure that the changes imposed do not negatively affect the results of the fisheries and permit the proposal of solutions. (Measure SE-Mit-13 – see 7.3.4.4.1.2)

These mitigation measures will limit the magnitude of the impact to a medium level as distance from fishing areas will still involve potential fuel expenses.

The proposed measures result in a **high severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

7.3.4.4.5 Summary

Table 114: Permanent impact during Construction - Socio-Economic Environment - Fishing

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Fish-W-Def-1	Loss of direct access to the fishermen landing sites	Adverse	Major	SE-Comp-1	Compensation - Resettlement Action Plan (RAP).	Medium
				SE-Mit-13	Mitigation - Support and fishermen's complaint management plan	
SE-Fish-W-Def-2	Loss of fishing infrastructures	Adverse	Major	SE-Comp-1	Compensation- Resettlement Action Plan (RAP).	Low
				SE-Mit-13	Mitigation - Support and fishermen's complaint management plan.	
SE-Fish-W-Def-3	Increased distances and travel times to fishermen landing sites	Adverse	Medium	SE-Comp-1	Compensation - Resettlement Action Plan (RAP).	Low
				SE-Mit-13	Mitigation - Support and fishermen's complaint management plan.	
SE-Fish-W-Def-4	Increased time and distance to preferred fishing areas	Adverse	High	SE-Mit-10	Mitigation - RAP follow-up plan	Medium
				SE-Mit-13	Mitigation - Support and fishermen's complaint management plan.	

7.3.4.5 Impacts on community mobility

7.3.4.5.1 Impact SE-Mob-W-Def-1: Resettlement of displaced people from the main road line

Source of the impact: Construction of the runway and airport infrastructures

7.3.4.5.1.1 Positive impact

The construction of the runway and the airport infrastructures will lead to the Sainte Marie villager's relocation which is an isolated town of the region of Plaine Corail. The relocation of the villagers to the proposed areas will result in their being closer to the main road exiting the airport.

The inhabitants of the village are sensitive receptors since they are directly impacted and the consequences of this resettlement represent a significant opportunity for them because of the time savings obtained when travelling to the service infrastructures available.

This positive impact does not imply the need for specific improvement measures to be established.

The impact severity is medium. Considering the receptor sensitivity assessed as medium, the impact magnitude is medium.

7.3.4.5.2 Impact SE-Mob-W-Def-2: Reduction of the travel time to health and education infrastructures (cumulative impact)

Source of the impact: Resettlement of displaced people closer to the main road

7.3.4.5.2.1 Positive impact

The resettlement of the villagers of Sainte Marie closer to the main traffic road inevitably implies the shortening of transport times to schools for children or health centres for all the villagers.

The decrease in travel times is a positive impact for the villagers of Sainte Marie, proposed for relocation, who are receptors demonstrating distinct sensitivity to this closer relocation.

This positive impact does not imply the need for specific improvement measures to be established.

The impact severity is high. Considering the receptor sensitivity assessed as high, the impact magnitude is high.

-
-

7.3.4.5.3 Summary

Table 115: Permanent impact during Construction - Socio-Economic Environment - Community Mobility

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Mob-W-Def-1	Resettlement of displaced people closer to the main road	Positive	Medium		No improvement measure to undertake	Medium
SE-Mob-W-Def-2	Reduced travel time to health and education infrastructures	Positive	High		No improvement measure to undertake	High

7.3.5 Air quality and noise

None.

7.3.6 Heritage resources and visual environment

7.3.6.1 Paleontology

Impacts and measures on paleontology are associated and therefore addressed in the karst chapter 7.3.1.3 Geotechnics and Hydrogeology.

7.3.6.2 Landscape and visual environment

7.3.6.2.1 Impact Vis-W-Def-1: alteration of the living environment

7.3.6.2.1.1 Impact before mitigation

Sources of permanent and irreversible impact associated with the construction phase may include:

- Permanent earthworks;
- The disappearance of Mont Sainte Marie landform;
- Demolition of residential buildings;
- Construction of airport buildings and airport infrastructures.

The landform and coastline are very attractive landscapes with highly valued and untouched features. In history, natural environments have been severely degraded and modified. But impacts on the landform and coast are unprecedented in Rodrigues.

General sensitivity to alteration of the living environment of main landscape features can therefore be considered high.

Impacts listed before are likely to occur with an absolute certainty.

Loss of Mount Sainte Marie landform, population shift and change in coastline are a permanent loss to key elements of the landscape character, which results in fundamental change.

The **impact severity is major**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is major**.

7.3.6.2.1.2 Mitigation measure and impact after mitigation

A series of mitigation measures will help to minimize the landscape and visual impacts of construction activities. These measures will be:

- Permanent fences and earthworks will be arranged to reduce visual intrusion on neighboring homes;
- Plantings (trees and bushes) will be designed and arranged to form visual screening to mitigate visual impacts from nearby roads and homes;
- Early planting needed for efficient screens when construction works starts.
- Screen planting does contribute to construction acceptance and generally speaking planting contributes to a positive perception of the construction phase; Screen planting is described in Chapter 7.4.6.2.

Those mitigation measures will limit the landscape impact at a high change.

There is a risk on living environment of considering visual and aesthetic measures as secondary or unnecessary.

The proposed measures result in a **major severity mitigated impact**. Thus, **The residual impact is of high magnitude**.

7.3.6.2.2 Impact Vis-W-Def-2: increasing pressure on island landscape

7.3.6.2.2.1 Impact before mitigation

Sources of permanent and indirect impacts associated with the construction phase may include:

- Problems related to the densification, or even concentration of habitat due to workers accommodation building and construction activity,
- Acceleration of natural spaces consumption.

Population shift might reflect in dispersed buildings or new community settlements. The impacts on the landscape will depend on actual landscape tolerance to changes. Natural environments and landscapes have been severely degraded and modified.

General sensitivity to pressure increase on the island's landscapes can therefore be considered medium.

Indirect impacts have moderate to high chances to occur.

Loss of elements of the landscape character, or alteration to key elements of the landscape character, might result in noticeable to partial change of character.

The **impact severity is high**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is high**.

7.3.6.2.2.2 Mitigation measure and impact after mitigation

Two mitigation measures will help to minimize the landscape and visual impacts of construction activities:

- Establishment of an Airport Urban Development Master Plan to monitor and frame urban development related to airport activity and ensure sustainable good living conditions;
- Early street planting prior to urban development and building construction.

Rodrigues environment and landscape are altered and fragile. These mitigation measures will permit the limitation of the magnitude of the impact to a medium level.

The proposed measures result in a **high severity mitigated impact**. Thus, **The residual impact is of medium magnitude**.

7.3.6.2.3 Summary

Table 116: Permanent impact during Construction - Visual & Landscaping

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Vis-W-Def-1	Alteration of the living environment	Adverse	Major	Land-Mit-7	Permanent fences and earthworks will be arranged to reduce visual intrusion on neighboring homes	High
				Land-Mit-9	Plantings are designed and arranged to form visual screens	
Vis-W-Def-2	Increasing pressure on the island's landscape	Adverse	High	Land-Mit-14	Establishment of an Airport Urban Development Master Plan to monitor and frame urban development related to airport activity and ensure sustainable good living conditions	Medium
				Land-Mit-13	Community support in construction process	

7.4 Impacts during operation phase

The project aims to enable Rodrigues Island to develop tourism and aerial cargo. Tourism development might have significant impacts on the environment.

However, this ESIA only aims to address the impacts of the infrastructure. Thus, the socio-economic development and changes that could be expected due to the air access improvement are not part of this ESIA scope.

Impacts of the airport extension on tourism and socio-economics on an island scale are addressed in other studies carried out under RRA's control.

7.4.1 Physical environment

7.4.1.1 Marine physical environment: shores, currents, turbidity and sedimentation

The main impacts during operational phase on the marine physical environment are:

- Accidental spillage;
- Uncontrolled wastewater discharges.

7.4.1.1.1 Impact Phy-Mar-Op-1

7.4.1.1.1.1 Impact before mitigation

The activities of the airport and the jetty facilities will not impact the marine physical environment on their normal operational phase. However, airport operational activities use various chemicals and dangerous substances. Accidental spills or leaks of solid or liquid waste into the surroundings of the airplane or jetty during operations might occur and result in marine water contamination.

The main receptor affected by this action may be the seawater quality.

The impact severity is high. Considering the receptor sensitivity assessed as high, the impact magnitude is high.

7.4.1.1.1.2 Mitigation measure and impact after mitigation

Mitigation measures to reduce adverse impact of the spilling are:

- Prevent spills and accidents by training staff to avoidance of spills;
- Implementing a protocol for depollution in case of spill;
- Implementing methodologies for quick confining and treatment of pollutants.

The proposed measures result in a low severity mitigated impact. Thus, the residual impact is of low magnitude.

7.4.1.1.2 Impact Phy-Mar-Op-2

7.4.1.1.2.1 Impact before mitigation

Three discharge points are releasing collected rainwater from the runway and the upstream watershed. An extra release point is located North of the boathouse and is discharging treated used water and rainwater, previously transiting by an oil separator and a buffer storage unit, in

case of water surplus during extreme event. (See Water Resource and Waste water management part.)

These discharges represent a small volume of fresh water input to the ocean compared to the water runoff naturally present due to the downward slope. Their impacts on the hydrodynamic circulation are marginal.

Treatment devices are, under normal circumstances, minimizing the level of contaminant in the water released into the ocean. During extreme events, pollution is diluted in large volumes of rainwater.

The main receptor affected by this action may be the seawater quality.

The impact severity is low. Considering the receptor sensitivity assessed as medium, **the impact magnitude is low.**

7.4.1.1.2.2 Mitigation measure and impact after mitigation

As the impact magnitude is low, no mitigation measure is necessary.

7.4.1.1.3 Summary

Table 117: Impact during Operation - Physical Environment- Marine Environment

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Phy-Mar-Op-1	Accidental spillage	Adverse	Major	Phy-Mar-Mit-6	Prevent spills and accidents : train staff to avoidance of spills	Low
				Phy-Mar-Mit-7	Implementing methodologies for quick confining and treatment of pollutants and protocol for depollution in case of spill	
Phy-Mar-Op-2	Uncontrolled waste water discharges	Adverse	Low	None	-	-

7.4.1.2 Hydrology

The project involves significant movement of excavated soil and fill, significantly altering the natural watersheds on the southern part of the existing facilities. The map below shows the current and post-development sub-watersheds and highlights the right-of-way of the modified watersheds and runoff axes.



Figure 181: Evolution of the catchment areas after development

The main potential impacts of the project on hydrology are the following:

- Changes in the general topography of the site can result in changes in runoff flow dynamics and threaten to flood the airport facilities themselves or downstream issues.
- Resloping and flow concentration can increase soil erosion in non-sealed watersheds and increase the transfer of materials to the lagoon.
- Leaching of runways, car parks and taxiways by stormwater creates chronic pollution towards the surrounding natural environment. In addition to this risk of chronic pollution, there is also a risk of accidental pollution created by the discharge of pollutants or water from firefighting.

7.4.1.2.1 Impact Phy-Hyd-Op-1: Stormwater management

7.4.1.2.1.1 Impact before mitigation

Sources of permanent impact of the project include flooding of facilities that could interrupt the proper functioning of the airport: buildings, technical installations and runway.

The construction of the runway requires the creation of a large excavation to the North of the runway. The water flowing on this artificial hillside flows by gravity towards the runway, creating a risk of flooding the runway. On the southern part of the runway, the topography slopes down towards the ocean, thus allowing gravitational water runoff without impacting the runway.

The **impact severity is major**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is major**.

7.4.1.2.1.2 Mitigation measure and impact after mitigation

To mitigate these impacts, the stormwater networks will be sized to collect at least the flows generated by a 50-year return rainfall period:

- Runway: a large ditch located at the bottom of the artificial hillside and below the runway will allow the drainage of hillside runoff (cut-off drain) and runway water over and above the capacity of the network collecting the first runoff water,
- Extension of the existing airport facilities, to the North of the new runway: the networks will collect the runoff to the new buffer pond.

The proposed measures result in a not significant severity mitigated impact. Thus, **The residual impact is of low magnitude**.

7.4.1.2.2 Impact Phy-Hyd-Op-2: Flooding of issues downstream of airport facilities

7.4.1.2.2.1 Impact before mitigation

Mitigation measure Phy-Hyd-Mit-1

Soil sealing (extension of existing buildings, new buildings, car parks, taxiways and runways) and to a lesser extent the modification of the topography of the natural terrain (with a local increase in flow slopes) lead to an increase in the runoff flows on the site and discharged downstream.

Since discharge is done directly into the sea, the increase in runoff flows does not threaten any built environment.

However, the earthworks slightly modify the watershed draining the water towards the cave of Petit Lac, above Anse Quitor. However, the change in flow rates induced to this site remains insignificant.

The impact severity is not significant. Considering the **receptor sensitivity assessed as low**, **the impact magnitude is low**.

7.4.1.2.2.2 Mitigation measure and impact after mitigation

Mitigation measure Phy-Hyd-Mit-2

To mitigate the impact on the caves, the stormwater ditch located north of the runway is positioned to restore the boundary of the existing watershed draining water to the cave of Petit Lac.

Mitigation measure Phy-Hyd-Mit-3

To address climate change adaptation for the reduction of peak flows and run off, mitigation measures include:

- A buffering storage at the outlet of the drainage network located north of the runway, sized for a 2-year return rainfall period,
- Works facilitating infiltration: large vegetated ditch to reduce flow speed, hillside vegetation.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of **negligible magnitude**.

7.4.1.2.1 Impact Phy-Hyd-Op-3: Transfer of pollution to the natural environment

7.4.1.2.1.1 Impact before mitigation

The leaching of runways, car parks and taxiways by rainwater creates chronic pollution towards the surrounding natural environment. In addition to this risk of chronic pollution, there is also a risk of accidental pollution created by the discharge of pollutants or water from firefighting.

The **impact severity is major**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is major**.

7.4.1.2.1.2 Mitigation measure and impact after mitigation

Mitigation measure Phy-Hyd-Mit-4

The aim of the proposed mitigation measures is to treat chronic or accidental sources of pollution before release into the natural environment. They include:

- To the North of the new runway, the outlet of the roads, parkings and taxiways watertight stormwater network will be equipped with an oil separator and sedimentation works designed to collect and treat up to 20% of the flow generated by a 2-year return period rainfall. The outlet of this network is also to be equipped with initial storage works associated with a valve to isolate the flow from the natural environment in the event of accidental pollution (leakage of polluting liquids, fire fighting, etc.).
- The stormwater drainage of the **new runway** and associated taxiways is designed to collect the first flows of runoff loaded with potential pollutants in a waterproof network, connected with oil separators and sedimentation works. The outlet of this network is also equipped with storage works associated with a valve to isolate the flow from the natural environment in the event of pollution (leakage of polluting liquids, water from fire fighting, etc.). All these structures will be designed to collect and treat up to 20% of the flow generated by a 2-year return period rainfall. Over and above these first flows, the water is to be evacuated away from the runway to avoid any risk of flooding.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of **low magnitude**.

7.4.1.2.2 Impact Phy-Hyd-Op-4: Transfer of sediments to the lagoon

7.4.1.2.2.1 Impact before mitigation

The project can increase the supply of materials to the lagoon, destabilizing the ecosystem:

- Changing the topography of the site associated with the concentration of flows can create erosion of the natural terrain,

- Leaching of artificial soils may result in the discharge of more or less polluting suspended solids.

The impact severity is high. Considering the receptor sensitivity assessed as major, the impact magnitude is major.

7.4.1.2.2 Mitigation measure and impact after mitigation

Mitigation measure Phy-Hyd-Mit-5

The aim of the proposed mitigation measures is to avoid erosion on hillsides and drains concentrating the collected flows, and the discharge of suspended solids from the runway, taxiways and parking. They include:

- Vegetation of slopes and ditches,
- Collection of runway, taxiway and parking runoff in watertight networks equipped with sedimentation works at their outlets.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of low magnitude.

7.4.1.2.3 Summary

Table 118: Impact during Operation - Physical Environment- Hydrology

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Phy-Hyd-Op-2	Flooding of issues downstream of airport facilities	Adverse	Major	Phy-Hyd-Mit-2	Stormwater network sized to collect at least the flows generated by a 50-year return rainfall period	Low
Phy-Hyd-Op-2	Transfer of pollution to the natural environment	Adverse	Low	Phy-Hyd-Mit-3	Restore the boundary of the existing watershed draining water to the cave of Petit Lac	Negligible
				Phy-Hyd-Mit-4	Creation of buffering storage and works facilitating infiltration	
Phy-Hyd-Op-3	Increase of the supply of materials to the lagoon	Adverse	Major	Phy-Hyd-Mit-5	Watertight stormwater network equipped with: <ul style="list-style-type: none"> - Oil separator and sedimentation works designed to collect and treat up to 20% of the flow generated by a 2-year return period rainfall. Gates and tanks to isolate accidental pollution, including water from firefighting.	Low
Phy-Hyd-Op-4	Flooding of issues downstream of airport facilities	Adverse	Major	Phy-Hyd-Mit-6	<ul style="list-style-type: none"> - Vegetation of slopes and ditches, Collection of runway, taxiway and parking runoff in watertight networks equipped with sedimentation works at their outlets.	Low

7.4.1.3 Geotechnics and Hydrogeology

7.4.1.3.1 Impact Phy-Kar-Op-1: Collapse / Erosion

7.4.1.3.1.1 Impact before mitigation

Erosion and collapse/settlement risks are applicable to both the construction and operation phase of the new runway. These are controlled by the erosive potential of the in situ ground formations (calcarenites, weathered basalts) in relation with karstic network activity.

The impact severity is high. Considering the receptor sensitivity assessed as major, the impact magnitude is high.

7.4.1.3.1.2 Mitigation measure and impact after mitigation

Management will be required throughout the construction and during operations in accordance with BS 6031:2009 requirements.

Additional ground investigations need to be performed to better understand the geological and geotechnical characteristics inside and outside the project area, especially supplementary geotechnical and geophysical investigations to characterize the karstic network (caves and voids), by in situ investigation diagnostic of infilled cavities (televsual cavity inspections).

Rock testing (Aggregate Testing) additional laboratory studies will be needed to inform of consolidation and settlement potential within the Rodrigues Airport new runway project area.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of low magnitude.

7.4.1.3.2 Phy-Kar-Op-2: Access to caves

7.4.1.3.2.1 Impact before mitigation

During the airport's operational phase, impacts focus on accessibility to the caves if they have not been filled and sealed. That is, a protection structure would then have been installed to allow controlled access by airport authorities. This scenario is only valid if the cave entrance is not in the direct area of the airstrip.

The impact severity is high. Considering the receptor sensitivity assessed as, the impact magnitude is high.

7.4.1.3.2.2 Mitigation measure and impact after mitigation

Reference and check all caves and caverns entries within the footprint of the runway project. A protective formwork needs to be planned, or in any manner, access to airport must be restricted to necessary construction and operations staff.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of low magnitude.

7.4.1.3.3 Phy-Kar-Op-3: Pollution of groundwater

7.4.1.3.3.1 Impact before mitigation

Potential impacts on groundwater contamination have been addressed in sections 7.2.1.3 Geotechnics and Hydrogeology of the karstic system, 7.2.1.4 Water resource and waste water

management, 7.3.1.3 Geotechnics and Hydrogeology and 7.3.1.4 Water resource and waste water management for the works phase.

During the airport's operating period, it is the fuel filling operations of aircraft and other service vehicles that present the greatest risk of contamination. These operations must therefore take place in specially developed sites with appropriate means of restraint in the event of a spill.

At this stage of the study, there is not enough data to assess groundwater quality. Therefore, when the airport is operational, a network of observation wells will have to be installed and a water quality monitoring program will have to be implemented.

According to the possible construction options, there is no catchment work planned downstream of the airport infrastructure. There are therefore no specific measures to be implemented at this level.

The impact severity is high. Considering the receptor sensitivity assessed as high, the impact magnitude is medium.

7.4.1.3.3.2 Mitigation measure and impact after mitigation

Impact mitigation consists mainly of the application of an emergency plan in the event of a spill of hydrocarbons or other liquids presenting a risk of a change in the quality of groundwater in Plaine Corail.

The proposed measures result in low severity mitigated impact. Thus, The residual impact is of low magnitude.

7.4.1.3.4 Summary

Table 119: Impact during Operation - Physical Environment- Karstic Environment

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Phy-Kar-Op-1	Collapse and settlements	Adverse	High	Phy-Kar-Av-22	Supplementary geotechnical and geophysical investigations to characterize the karstic network (caves and voids)	Low
				Phy-Kar-Mit/Comp-23	In situ investigation diagnostic of infilled cavities (televsual cavity inspections)	
				Phy-Kar-Mit/Comp-24	Additional laboratory testings (Aggregate testings) to characterize the erosive potential of in situ geological formations	
Phy-Kar-Op-3	Access to caves	Adverse	High	Phy-Kar-Av-16	restrict access to airport to necessary construction and operations staff	Low
Phy-Kar-Op-4	Pollution of groundwater	Adverse	Medium	Phy-Kar-Av-25	All operations involving hydrocarbons must comply with current standards to prevent spills and, if necessary, implement emergency measures.	Low
				Phy-Kar-Mit-26	Do not allow groundwater use downstream of airport infrastructure	

7.4.1.4 Water resource and domestic waste water

7.4.1.4.1 Impacts Phy-Wat-Op-1 and Phy-Wat-Op-2 associated to stormwater drainage

7.4.1.4.1.1 Impact before mitigation

This project of a new runway, at the Preliminary Design stage, includes an infiltration drainage network along the runway to address the stormwater issue, associated with oil separators before discharge into the environment. However, no buffering is included to reduce the peak flows. The Preliminary Design does not propose the reuse of the stormwater collected and pre-treated. The resulting potential environmental impacts are:

Major impact due to:

- Pollution of the soil due to direct infiltration of stormwater without prior oil separation.
- Pollution also due to an eventual firefighting operation on the runway with no possibility of confining the effluents generated.

Major impact due to no reduction of peak flow, runoff and soil erosion, leading to increasing sedimentation of water bodies including lagoons, thus threatening biodiversity, corals and white sandy beaches.

The impact severity is high. Considering the receptor sensitivity assessed as major, the impact magnitude is major.

7.4.1.4.1.2 Mitigation measure and impact after mitigation

A non infiltrating drainage network will be implemented to convey the stormwater to oil separators for pre-treatment and then to a buffer storage for reuse within the framework of an integrated water management plan. This will enable to address and **avoid** the above mentioned impacts, bringing them to **negligible**.

The proposed measures result in a not significant mitigated impact. Thus, The residual impact is of **negligible magnitude**.

7.4.1.4.2 Impact Phy-Wat-Op-3 associated to the waste water management

7.4.1.4.2.1 Impact before mitigation

This project of a new runway, at the Preliminary Design stage, includes a new sewer network associated with a Water Treatment Plant to cater for the domestic wastewater of the airport, including the new control tower and the fire and rescue services. The treated wastewater is to be discharged at sea after proper treatment to the required corresponding standards. The Preliminary Design does not propose the reuse of the treated wastewater which will then require a higher level of treatment. The resulting potential environmental impact is a **low impact** on the environment (sea) in which the treated water is discharged according to basic minimum standards.

The impact severity is low. Considering the receptor sensitivity assessed as high, the impact magnitude is low.

7.4.1.4.2.2 Mitigation measure and impact after mitigation

The implementation of a Water Treatment Plant within the framework of an integrated water management plan with the reuse of the treated wastewater, and with an objective of zero discharge, leads to a higher level of treatment. This will enable to address and **mitigate** the above mentioned impact, bringing it to **negligible**.

The proposed measures result in a low severity mitigated impact. Thus, The residual impact is of **negligible magnitude**.

7.4.1.4.3 Impact Phy-Wat-Op-4 : Water supply management

7.4.1.4.3.1 Impact before mitigation

This project of a new runway, at the Preliminary Design stage, includes a Water supply network associated with water tanks connected to the existing public network which is non performant. No alternative proposed. The resulting potential environmental impact is:

High impact due to an extra burden on the water supply public network requirements due to an increased volume required.

The **impact severity is major**. Considering the **receptor sensitivity assessed as medium**, **the impact magnitude is high**.

7.4.1.4.3.2 Mitigation measure proposed and attenuated impact after mitigation

The implementation of an integrated water management plan with the reuse of the treated wastewater and stormwater collected, leads to the **mitigation** of the above mentioned impact, bringing it to **low**.

The proposed measures result in a **high severity mitigated impact**. Thus, **The residual impact is of low magnitude**.

7.4.1.4.4 Summary

Table 120: Impact during Operation - Physical Environment- Water & Wastewater

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Phy-Wat-W-Def-1	Pollution of soil and surface water	Adverse	Major	Phy-Wat-Av-6	Integrated water management plan	Negligible
Phy-Wat-W-Def-2	Peak flows resulting in increasing soil erosion	Adverse	Major	Phy-Wat-Av-6	Integrated water management plan	Negligible
Phy-Wat-W-Def-3	Pollution of marine water	Adverse	Low	Phy-Wat-Mit-7	Water treatment plant	Negligible
Phy-Wat-W-Def-4	Extra burden on the water supply public network	Adverse	High	Phy-Wat-Mit-8	Reuse water plan	Low

7.4.2 Biological environment

7.4.2.1 Terrestrial biodiversity

None.

7.4.2.2 Marine habitats

The main potential direct impacts on marine ecology in the operational phase are the:

- Modification of ecological functionality;
- Modification of the physical functioning of habitats induced by the facilities (hydrosedimentary modification, current change...).

7.4.2.2.1 Impact BioM-Hab-Op-1: Modification of ecological functionality

7.4.2.2.1.1 Impact before mitigation

The operations at the airport, including vehicular movements and new aircraft flight paths, are the primary potential sources of these impacts.

Marine habitats not destroyed by construction activities may be impacted by operational activities, including the movement of operational ships through maintenance activities during the operational phase. In the maritime environment, these maintenance operations will be reduced. Rotations will provide an initial response and undertake routine patrols of the immediate area.

Stormwater and wastewater discharges will be done in Anse Quitar (new runway) and in the offshore area near the Boat House. Nevertheless, the water will be treated before discharge. An oil separator will be installed in a buffer tank. The risk of degradation of the water quality of the environment is therefore limited.

The impact severity is not significant. Considering the receptor sensitivity assessed as low or high, the impact magnitude is negligible.

7.4.2.2.1.2 Mitigation measure and impact after mitigation

No measure is proposed.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of negligible magnitude.

7.4.2.2.2 Impact BioM-Hab-Op-2: Modification of the physical functioning of habitats

7.4.2.2.2.1 Impact before mitigation

The development of the project at sea will induce discharges into the marine environment, ie hydrosedimentary modification, current change. These changes are not significant for the project.

The impact severity is not significant. Considering the receptor sensitivity assessed as low or high, the impact magnitude is negligible.



7.4.2.2.2 Mitigation measure and impact after mitigation

No mitigation measure is proposed.

The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of **negligible magnitude**.

7.4.2.2.3 Summary

Table 121: Impact during Operation - Biological Environment – Marine Habitats

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
BioM-Hab-Op-1	Modification of ecological functionality	Adverse	Negligible	none	-	Negligible
BioM-Hab-Op-2	Modification of the physical functioning of habitats	Adverse	Negligible	none	-	Negligible

7.4.3 Transport network, electricity supply and waste management

7.4.3.1 Transport network

7.4.3.1.1 Trspt-Op-1: Impact on the transport network

7.4.3.1.1.1 Impact before mitigation

Road

The road infrastructure around the study area will be modified by the project. As the objective of the project is to develop tourism and supply to the island, it will in turn increase road traffic on the island, to and from the airport, but also throughout the island. Tourist sites and the largest cities will be the most affected.

Air

The objective of the project is to increase the current airport's capacity.

Maritime routes

None

The impact severity is low. Considering the receptor sensitivity assessed as low, **the impact magnitude is low.**

7.4.3.1.1.2 Mitigation measure and impact after mitigation

The road network around the airport will be restored through the construction of a new road.

The proposed measures result in a low severity mitigated impact. Thus **The residual impact is of low magnitude.**

7.4.3.2 Electricity supply

7.4.3.2.1 Impact Elect-Op-1: Impact on electricity supply

7.4.3.2.1.1 Impact before mitigation

The new airport may have a slightly higher energy consumption, in particular due to the expansion or arrival of new equipment.

The impact severity is low. Considering the receptor sensitivity assessed as low, **the impact magnitude is low.**

7.4.3.2.1.2 Mitigation measure and impact after mitigation

This increase in consumption can be supported by the current network. No measures are necessary.

The proposed measures result in a low severity mitigated impact. Thus, **The residual impact is of low magnitude.**

7.4.3.3 Solid waste management

7.4.3.3.1 Impact Sol-Wst-Op-1: Impact on the solid waste

7.4.3.3.1.1 Impact before mitigation

During the operational phase, additional waste production can be expected due to the increase of airport passengers and tourists on the island.

The impact severity is low. Considering the receptor sensitivity assessed as low, **the impact magnitude is low.**

7.4.3.3.1.2 Mitigation measure and impact after mitigation

The solid waste will be managed with the rest of the island's waste, therefore no special measures are required

The proposed measures result in a low severity mitigated impact. Thus, **The residual impact is of low magnitude.**

7.4.3.4 Summary

Table 122: Impact during Operation – Transport Network, Electricity Supply & Waste Management

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Trspt-Op-1	Impact on the transport network	Adverse	Low	Inf-Mit-7	Restore road connections	Low
Elec-Op-1	Impact on electricity supply	Adverse	Low	None	None	Low
Sol-Wst-Op-1	Impact on the solid waste	Adverse	Low	None	None	Low

7.4.4 Socio-economic environment

7.4.4.1 Impacts on power, governance and civil society

Source of the impact: Launching local development initiatives

7.4.4.1.1 Impact SE-Gov-Op-1: Improved relations with directly and indirectly impacted communities (cumulative impact)

Source of the impact: Launching local development initiatives

7.4.4.1.1.1 Positive impact

The project for the construction of airport infrastructures represents an opportunity leading to local development potential, the initiatives of which will permit an improvement of the social climate within the communities if they are adequately organized.

All of the surrounding communities of the airport project are directly affected by this type of impact that can have a significant socio-economic impact on the different phases of the project.

The impact severity is medium. Considering the receptor sensitivity assessed as medium, the impact magnitude is medium.

7.4.4.1.1.2 Improvement measure and impact after improving

Improvement (bonus) measures help to increase the significance or value of the positive impacts of the project. In accordance with the same objectives of mitigating or or compensating for negative impacts. Improvement or bonus measures can be integrated into the project to:

- Implement regular meetings and consultations to measure the expectations and needs of impacted communities with regard to the initiatives they would like to integrate into the development of the area. (Measure SE-5 - see 7.2.4.1.1.2)
- Establish a local development plan in collaboration with the communities in the area following the results obtained from the joint consultations in order to propose compatible and adequate support measures in relation to the expectations formulated. (Measure SE-Mit-15 – see 7.2.4.5.2.2)

These improvement measures will permit the achievement of an impact magnitude at a high level as this represents a regular mention expressed by communities.

The proposed measures result in a medium severity mitigated impact. Thus, the residual impact is of high magnitude.

7.4.4.1.2 Summary

Table 123: Impact during Operation - Socio-Economic Environment – power, governance and civil society

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Gov-Op-1	Improved relations with directly and indirectly impacted communities	Positive	Medium	SE-Mit-5	Mitigation – Communication plan for the integration of external workers.	High
				SE-Mit-15	Economic support plan for households.	

7.4.4.2 Impacts on land

7.4.4.2.1 Impact SE-Land-Op-1: Increase of social tensions in relation to the land resource

Source of the impact: Involuntary displacement of the populations affected by the project

7.4.4.2.1.1 Impact before mitigation

The risk of the emergence of social tensions in relation to the use of land resources is a potential problem to be taken into consideration between the communities that will need to be displaced and the communities in the proposed areas for relocations. In addition to the habitat, it involves particularly the land use sharing related to agriculture and pastures that may be at the source of these potential tensions.

All of the communities in the area directly impacted by the construction project as well as that of the towns proposed for relocation are the direct receptors of this potentially major impact of pressure on agro-pastoral systems. Support measures must be taken into consideration on this aspect.

The **impact severity is major**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is major**.

7.4.4.2.1.2 Mitigation measure and impact after mitigation

To mitigate this impact, it is proposed to apply an internal communication and support plan for all villagers and displaced users and residents of the towns of the proposed relocation areas. This plan must incorporate a regular consultation process to collect the sources of dissatisfaction and to obtain proposals for solutions formulated by the communities themselves. (Measure SE-3 – see 7.2.4.2.1.2)

These mitigation measures will permit the limitation of the magnitude of the impact to a medium level as land sharing, especially concerning pastures, remains a major concern.

The proposed measures result in a **major severity mitigated impact**. Thus, **The residual impact is of medium magnitude**.

7.4.4.2.2 Impact SE-Land-Op-2: Evolution of land management procedures

Source of the impact: Involuntary displacement of the populations affected by the project

7.4.4.2.2.1 Impact before mitigation

The involuntary displacement of the populations affected by the construction project will entail a necessary adaptation of the different communities to the use of spaces. Indeed, the relocation of the villagers of Sainte Marie in the proposed areas of resettlement will call for a necessary organisation and agreements in connection with the village communities already present. This is particularly relevant for agricultural land and in particular livestock breeding, the main activity of all the inhabitants of the area.

The main receptors of this irreversible impact on livestock-related land management are the inhabitants of the towns proposed for the relocation and of course the villagers of Sainte Marie, the livestock breeders of the Bangélique area.

The **impact severity is major**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is major**.

7.4.4.2.2 Mitigation measure and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a communication plan (including a complaint management plan) and internal support to all villagers and displaced users and residents of the towns of the proposed relocation areas. This plan must incorporate a regular consultation process to collect the sources of dissatisfaction and to obtain proposals for solutions formulated by the communities themselves. (Measure SE-Mit-3 – see 7.2.4.2.1.2)
- Implement integrated technical support measures to facilitate specific adaptation to new agricultural management and pasture parcels. (Measure SE-Mit-9 – see 7.2.4.3.2.2)

These mitigation measures will permit the limitation of the magnitude of the impact to a medium level as land sharing out, especially concerning pastures, remains a major concern.

The proposed measures result in a **major severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

7.4.4.2.3 Summary

Table 124: Impact during Operation - Socio-Economic Environment – Land

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Land-Op-1	Increasing social tensions in relation to the land resource	Adverse	Major	SE-Mit-3	Mitigation - Communication plan, complaint management and internal support for relocation.	Medium
SE-Land-Op-2	Evolution of land management procedures	Adverse	Major	SE-Mit-3	Mitigation - Communication plan, complaint management and internal support for relocation.	Medium
				SE-Mit-9	Mitigation - Agricultural technical support plan.	

7.4.4.3 Impacts on agriculture and livestock

7.4.4.3.1 Impact SE-Agri-Op-1: Change in livestock breeding procedures and farming methods (cumulative impact)

Source of the impact: Involuntary displacement of the user populations of the area affected by the project

7.4.4.3.1.1 Impact before mitigation

This will directly impact the village community of Sainte Marie, the Bangélique livestock breeders but also the farmers/livestock breeders in the proposed area of relocation. The total number of animals accounted for by all affected people can become sizeable in the same area.

The currently very extensive grazing procedures in the construction area will most likely have to evolve in such a way as to remain viable. Likewise for the plantations, resettled people will probably not be able to keep the farm activity close to home as it is nowadays.

The issues for the populations mentioned here are paramount. The sensitivity of these issues is therefore major, because their socio-economic operational system is mainly based on agriculture and livestock breeding practices.

The impact severity is medium. Considering the receptor sensitivity assessed as major, the impact magnitude is high.

7.4.4.3.1.2 Mitigation measure and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a communication plan (including a complaint management plan) as well as methods of agricultural technical and possibly financial support of the communities during their period of adaptation and integration into their new environment. (Measure SE-Mit-9 – see 7.2.4.3.2.2)
- Promote the establishment of a timetable of visits and consultations of all the communities in the area in relation to the specific topics of integration of the displaced herds in their new environment and the evolution of the agro-pastoral system. (Measure SE-Mit-11 – see 7.2.4.4.4.2)

These mitigation measures will permit the limitation of the magnitude of impact to a medium level as farming and especially breeding will remain a cultural concern for local communities.

The proposed measures result in a medium severity mitigated impact. Thus, the residual impact is of medium magnitude.

7.4.4.3.2 Impact SE-Agri-Op-2: Need to regenerate the farmland

Source of the impact: Involuntary displacement of the populations affected by the project.

7.4.4.3.2.1 Impact before mitigation

The regeneration of new farmland exclusively concerns the community of Sainte Marie. The environment remains quite rough in the region in order to permit very productive agriculture, especially with frequent limestone resurgences and therefore shallow soils. The inhabitants of Sainte Marie have permitted the production of annual plants in their area thanks to their

agriculture/livestock association methods which allowed them to build a cultivatable stratum due to regular modifications of the organic matter.

The relocation of the inhabitants of Sainte Marie will inevitably lead to the need to regenerate soils in order to make them more fertile.

If agricultural productions do not represent the main activity of the inhabitants of Sainte Marie, they are an integral part of the means of their socio-economic functioning and thus represent a major issue.

The **impact severity is high**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is high**.

7.4.4.3.2.2 Mitigation measure and impact after mitigation

To mitigate this impact, it is proposed to:

- Establish a follow-up and support plan for farmers in different communities in relation to the establishment of semi-intensive farming and livestock methods in order to promote the integration of organic materials into the land parcels and contribute to the regeneration of the soil fertility. (Measure SE-9 – see 7.2.4.3.2.2)
- Promote the establishment of a timetable for visits and consultations of all the communities in the area in relation to specific topics concerning the evolution of agro-pastoral systems. (Measure SE-Mit-11 – see 7.2.4.4.4.2)

These mitigation measures will permit the limitation of the magnitude of impact to a medium level as soil fertility is one of the main conditions for the success of the communities' establishment.

The proposed measures result in a **high severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

7.4.4.3.3 Impact SE-Agri-Op-3: Decrease in livestock breeding activity

Source of the impact: Involuntary displacement of the populations affected by the project.

7.4.4.3.3.1 Impact before mitigation

The relocation of the villagers of Sainte Marie and the Bangélique livestock breeders will potentially lead to a direct impact on the livestock activity. The majority of the livestock breeding in the area currently planned for construction will be located in the vicinity of the proposed relocation area, in addition to the herds already present. This could lead to an overgrazing of the area and an obligation for livestock breeders to restrict herds, if livestock breeding methods do not adapt.

However, the probability of declining livestock breeding is not too high, if adequate support measures are taken. These measures must, however, be taken into consideration, because livestock breeding is a major issue for the communities concerned.

The **impact severity is major**. Considering the **receptor sensitivity assessed as major**, **the impact magnitude is major**.

7.4.4.3.3.2 Mitigation measure and impact after mitigation

To mitigate this impact, it is proposed to:

- Support livestock breeders from different communities in the establishment of semi-intensive farming methods in order to maintain herd sizes. (Measure SE-Mit-12 – see 7.2.4.4.4.2)
- Promote the establishment of a timetable of visits and consultations of all the communities in the area in relation to the specific topics of integration of the displaced herds in their new environment and the evolution of the agro-pastoral system. (Measure SE-Mit-11 – see 7.2.4.4.4.2)

These mitigation measures will permit the limitation of the magnitude of impact to a medium level as livestock represents a major socio-economic component for local communities.

The proposed measures result in a **major severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

7.4.4.3.4 Impact SE-Agri-Op-4: Change of the livestock breeding procedures (cumulative impact)

Source of the impact: Decrease in livestock breeding activity

7.4.4.3.4.1 Impact before mitigation

The villagers of Sainte Marie and the livestock breeders of the Bangélique area will have to raise their cattle on the proposed areas close to the town of Plaine Corail. The fact that these spaces are already used as pastureland by other livestock breeders could lead to a general change in the way cattle are managed. It is to be envisaged that the extensive management as it exists today must be reviewed and the practices must be adapted.

This is a major challenge for livestock breeders and is to be considered because the measures to be taken will condition the future of the livestock breeding of the area.

The **impact severity is high**. Considering the **receptor sensitivity assessed as major** **the impact magnitude is high**.

7.4.4.3.4.2 Mitigation measure and impact after mitigation

To mitigate this impact, it is proposed to:

- Support livestock breeders from different communities in the establishment of semi-intensive farming methods in order to maintain herd sizes. (Measure SE-Mit-12 – see 7.2.4.4.4.2)
- Promote the establishment of a timetable of visits and consultations of all the communities in the area in relation to the specific topics of integration of the displaced herds in their new environment and the evolution of the agro-pastoral system. (Measure SE-Mit-11 – see 7.2.4.4.4.2)

These mitigation measures will permit the limitation of the magnitude of the impact to a low level.

The proposed measures result in a **high severity mitigated impact**. Thus, **the residual impact is of low magnitude**.

7.4.4.3.5 Impact SE-Agri-Op-5: rehabilitation period of agricultural soils and surfaces (cumulative impact)

Source of the impact: Decrease in livestock breeding activity

7.4.4.3.5.1 Impact before mitigation

The decrease in livestock activity decreases at the same time the contribution of organic matter from animal origins, limiting the changes of cultivated soils and therefore can extend the period necessary for the regeneration of soils for crops.

Soil fertility is an important issue for local communities where agricultural plants represent a significant part of the economic and social functioning.

The **impact severity is high**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is high**.

7.4.4.3.5.2 Mitigation measure and impact after mitigation

To mitigate this impact, it is proposed to:

- Support livestock breeders from different communities in the establishment of semi-intensive farming methods in order to maintain herd sizes. (Measure SE-Mit-12 – see 7.2.4.4.4.2)
- Promote the establishment of a timetable of visits and consultations of all the communities in the area in relation to the specific topics of integration of the displaced herds in their new environment and the evolution of the agro-pastoral system. (Measure SE-Mit-11 – see 7.2.4.4.4.2)

These mitigation measures will permit the limitation of the magnitude of the impact to a medium level as soil fertility is one of the main conditions for the success of the communities' establishment.

The proposed measures result in a **high severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

7.4.4.3.6 Summary

Table 125: Impact during Operation - Socio-Economic Environment – Agriculture & Livestock

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Agri-Op-1	Change in livestock breeding procedures and farming methods	Adverse	High	SE-Mit-9	Mitigation - Agricultural technical support plan.	Medium
				SE-Mit-11	Mitigation - Community consultation plan for monitoring the evolution of the agro-pastoral system.	
SE-Agri-Op-2	Need to regenerate the farmland	Adverse	High	SE-Mit-9	Mitigation - Agricultural technical support plan	Medium
				SE-Mit-11	Mitigation - Community consultation plan for monitoring the evolution of the agro-pastoral system.	
SE-Agri-Op-3	Decrease in livestock breeding activity	Adverse	Major	SE-Mit-11	Mitigation - Community consultation plan for monitoring the evolution of the agro-pastoral system.	Medium
				SE-Mit-12	Mitigation - Support plan concerning livestock breeding techniques.	
SE-Agri-Op-4	Change of livestock breeding practices	Adverse	High	SE-Mit-11	Mitigation - Community consultation plan for monitoring the evolution of the agro-pastoral system.	Low
				SE-Mit-12	Mitigation - Support plan concerning livestock breeding techniques.	
SE-Agri-Op-5	Increase in the rehabilitation time of agricultural surfaces	Adverse	High	SE-Mit-11	Mitigation - Community consultation plan for monitoring the evolution of the agro-pastoral system.	Medium
				SE-Mit-12	Mitigation - Support plan concerning livestock breeding techniques.	

7.4.4.4 Impacts on the local economic context

7.4.4.4.1 Impact SE-Eco-Op-1: Decrease in household incomes (cumulative impact)

Source of the impact: Reduction of agriculture, livestock and fishing activities

7.4.4.4.1.1 Impact before mitigation

The reduction of agricultural and fishing activities in the entire airport area undoubtedly impacts household incomes since these activities are the main and often the only income source of the households.

This is a major socio-economic issue and the sensitivity of all households is definitely very high.

The impact severity is major. Considering the receptor sensitivity assessed as major, the impact magnitude is major.

7.4.4.4.1.2 Mitigation measure and impact after mitigation

To mitigate this impact, it is proposed to:

- Ensure the continuation of the timetable of visits and consultations of all the communities in the area in relation to the specific subjects of adaptation of the displaced and host communities to the changes observed in the income-generating activities. (Measure SE-Mit-14 – see 7.2.4.5.1.2)
- Maintain agricultural and fishing support measures through the services of the appropriate committees. (Measures SE-Mit-9 – see 7.2.4.3.2.2 and SE-Mit-13 – see 7.3.4.4.1.2)

These mitigation measures will permit the limitation of the magnitude of impact to a medium level as incomes from farming and fishing represent a socio-economic pillar for households.

The proposed measures result in a major severity mitigated impact. Thus, the residual impact is of medium magnitude.

7.4.4.4.2 Impact SE-Eco-Op-2: Increase in local production prices (cumulative impact)

Source of the impact: Reduction of agriculture, livestock and fishing activities

7.4.4.4.2.1 Positive impact

The reduction of activities related to agriculture, livestock and fisheries leads to a decrease in production and a decline in marketed quantities that encourages the increase in local production prices.

This impact can be positive due to the fact that this can help to improve the incomes of producers, livestock breeders and fishermen.

The impact severity is medium. Considering the receptor sensitivity assessed as medium, the impact magnitude is low.

7.4.4.4.2.2 Improvement measure and impact after improving

To promote this impact, it is proposed to:

- Follow up on a timetable of visits and consultations of all the communities in the area in relation to the specific subjects of adaptation of the displaced and host communities to the changes observed in income-generating activities. (Measure SE-Mit-15 – see 7.2.4.5.2.2)
- Maintain a favourable economic framework to enable households to balance income from income-generating activities. (Measure SE-Mit-15 – see 7.2.4.5.2.2)

These improvement measures will permit the achievement of an impact magnitude at a high level.

The proposed measures result in a medium severity mitigated impact. Thus, the residual impact is of high magnitude.

7.4.4.4.3 Impact SE-Eco-Op-3: Increase in local production prices (cumulative impact)

Source of the impact: Reduction of agriculture, livestock and fishing activities

7.4.4.4.3.1 Impact before mitigation

However, this impact can also be seen as an adverse impact on households in towns that see their purchasing power decrease. In this regard, the sensitivity of households is highly characterized making it an impact considered as high.

The impact severity is high. Considering the receptor sensitivity assessed as high, the impact magnitude is high.

7.4.4.4.3.2 Mitigation measure and impact after mitigation

- Follow up on the timetable of visits and consultations of all the communities in the area in relation to the specific subjects of adaptation of the displaced and host communities to the changes observed in income-generating activities. (Measure SE-Mit-14 – see 7.2.4.5.1.2)
- Create a favourable economic framework to enable households to balance income from income-generating activities. (Measure SE-Mit-15 – see 7.2.4.5.2.2)

These mitigation measures will permit the limitation of the magnitude of impact to a medium level.

The proposed measures result in a high severity mitigated impact. Thus, the residual impact is of medium magnitude.

7.4.4.4.4 Impact SE-Eco-Op-4: Increase in local development initiatives (cumulative impact)

Source of the impact: Reduction of agriculture, livestock and fishing activities

7.4.4.4.1 Positive impact

The reduction of agricultural or fishing activities may lead to the establishment and development of other activities to generate sufficient incomes for households in the communities or create opportunities for local entrepreneurship (e.g. through the women's association) that will respond to a growing demographic demand.

This positive impact concerns all the communities in the airport area and its environs and specifically those that will comprise the relocation areas of the villagers of Sainte Marie. This potentiality represents a considerable stake for all the communities.

The impact severity is medium. Considering the receptor sensitivity assessed as high, the impact magnitude is medium.

7.4.4.4.2 Improvement measure and impact after improving

To promote this impact, it is proposed to:

- Follow up on the timetable of visits and consultations of all the communities in the area in relation to the specific subjects of adaptation of the displaced and host communities to the changes observed in income-generating activities. (Measure SE-Mit-15 – see 7.2.4.5.2.2)
- Continue the establishment of household support measures to promote the integration of community-based development initiatives into the local economic context. (Measure SE-Mit-15 – see 7.2.4.5.2.2)

These improvement measures will permit the achievement of an impact magnitude at a high level.

The proposed measures result in a medium severity mitigated impact. Thus, the residual impact is of high magnitude.

7.4.4.4.5 Impact SE-Eco-Op-5: Increase in household incomes (cumulative impact)

Source of the impact: Creation of direct and indirect jobs

7.4.4.4.5.1 Positive impact

The project can promote job creation at the area level and for the benefit of local communities and even for women during the various phases of project management. These job creations will undeniably lead to the increase and possibly the securing of household incomes in the surrounding towns.

This positive impact here concerns all communities around the project and represents a high socio-economic issue for the project area.

The impact severity is medium. Considering the receptor sensitivity assessed as high, the impact magnitude is medium.

7.4.4.4.5.2 Improvement measure and impact after improving

To promote this impact, it is proposed to:

- Continue the workforce management plan incorporating a transparent recruitment process, promoting the recruitment of young people from the surrounding communities. (Measure SE-Mit-7 – see 7.2.4.1.3.2)
- Continue the regular communication plan concerning job opportunities with local communities. (Measure SE-Mit-7 – see 7.2.4.1.3.2)

These improvement measures will permit the achievement of an impact magnitude at a high level.

The proposed measures result in a **medium severity mitigated impact**. Thus, **The residual impact is of high magnitude**.

7.4.4.4.6 Impact SE-Eco-Op-6: Changing the local economic landscape (cumulative impact)

Source of the impact: Creation of direct and indirect jobs

7.4.4.4.6.1 Impact before mitigation

The creation of direct and indirect jobs implies a potential change in the local economic landscape, including the emergence of various companies creating an interesting economic dynamic in the airport area.

This impact can potentially be considered adverse to a lesser extent if specific support is not provided in order to harmonize future economic developments. While it may be classified as low-magnitude, this potential impact is nonetheless an issue to be taken into consideration.

The **impact severity is medium**. Considering the **receptor sensitivity assessed as medium**, **the impact magnitude is low**.

7.4.4.4.6.2 Mitigation measure and impact after mitigation

To mitigate this impact, it is proposed to:

- Implement a regular communication plan with local communities. (Measure SE-Mit-14 – see 7.2.4.5.1.2)
- Implement a management plan for local economic development to propose a harmonisation of community-based initiatives in response to the changing economic environment of the area. (Measure SE-Mit-15 – see 7.2.4.5.2.2)

These mitigation measures will permit the limitation of the magnitude of impact to a negligible level.

The proposed measures result in a **medium severity mitigated impact**. Thus, the residual impact is of **negligible magnitude**.

7.4.4.4.7 Impact SE-Eco-Op-7: Collaborative partnership or operational opportunities (cumulative impact)

Source of the impact: Creation of direct and indirect jobs

7.4.4.4.7.1 Positive impact

The potential for creating direct and indirect jobs can lead to the development of socio-economic projects involving the various parts of the surrounding towns of the airport project.

The presence of a favourable economic and social environment triggers opportunities for groupings of skills and thus the creation of partnerships.

This impact permits the establishment and maintenance of a positive socio-economic network within communities and can be an issue of considerable importance.

The impact severity is medium. Considering the receptor sensitivity assessed as medium, the impact magnitude is medium.

7.4.4.4.7.2 Improvement measure and impact after improving

To promote this impact, it is proposed to:

- Continue the regular communication plan with local communities. (Measure SE-Mit-15 – see 7.2.4.5.2.2)
- Implement a management plan for local economic development to propose a harmonisation of community-based initiatives in response to the changing economic environment of the area. (Measure SE-Mit-15 – see 7.2.4.5.2.2)

These mitigation measures will permit the limitation of the magnitude of impact to a medium level.

The proposed measures result in a medium severity mitigated impact. Thus, the residual impact is of medium magnitude.

7.4.4.4.8 Impact SE-Eco-Op-8: Reinforcement of professional skills (cumulative impact)

Source of the impact: Creation of direct and indirect jobs

7.4.4.4.8.1 Positive impact

New job creation opportunities during the various phases of the project represent a high potential to reinforce the professional skills of the surrounding populations, who will then have the opportunity to have access to certain professions that did not exist up until now in the area and therefore benefit from specific training to meet the demand.

This impact represents a highly positive opportunity for the local people and more evidently for the younger generations, who will complement the local skills palette and the citizens of Rodrigues more generally.

The impact severity is high. Considering the receptor sensitivity assessed as medium, the impact magnitude is medium.

7.4.4.4.8.2 Improvement measure and impact after improving

To promote this impact, it is proposed to:

- Ensure a regular communication plan with local communities. (Measure SE-7 – see 7.2.4.1.3.2)
- Continue to identify opportunities for economic development from local initiatives to provide training and support plans to reinforce professional skills. (Measure SE-Mit-15 – see 7.2.4.5.2.2)

These improvement measures will permit the achievement of an impact magnitude at a high level.



The proposed measures result in a high severity mitigated impact. Thus, the residual impact is of high magnitude.

7.4.4.4.9 Summary

Table 126: Impact during Operation - Socio-Economic Environment – Local Economy

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Eco-Op-1	Decrease in household incomes	Adverse	Major	SE-Mit-14	Mitigation - Plan for consultation and support of the communities of the area concerning the development of income-generating activities.	Medium
				SE-Mit-9	Mitigation - Agricultural technical support plan.	
				SE-Mit-13	Mitigation - Support and fishermen's complaint management plan.	
SE-Eco-Op-2	Increase in local production prices	Positive	Low	SE-Mit-15	Economic support plan for households.	High
SE-Eco-Op-3	Increase in local production prices	Adverse	High	SE-Mit-14	Mitigation - Plan for consultation and support of the communities of the area concerning the development of income-generating activities.	Medium
				SE-Mit-15	Mitigation - Economic support plan for households.	
SE-Eco-Op-4	Increase in local development initiatives	Positive	Medium	SE-Mit-15	Economic support plan for households.	High
SE-Eco-Op-5	Increase in household incomes	Positive	Medium	SE-Mit-7	Communication and hiring management plan	High
SE-Eco-Op-6	Change of the local economic landscape	Adverse	Low	SE-Mit-15	Mitigation - Economic support plan for households.	Medium
SE-Eco-Op-7	Opportunities for partnerships or cooperative operations	Positive	Medium	SE-Mit-15	Economic support plan for households.	High
SE-Eco-Op-8	Reinforcement of professional skills	Positive	Medium	SE-Mit-7	Communication and hiring management plan	High
				SE-Mit-15	Economic support plan for households.	

7.4.4.5 Impacts on the living environment and landscape

7.4.4.5.1 Impact SE-Liv-Op-1: Noise and sound pollution

Source of the impact: Construction of the runway and airport infrastructures

7.4.4.5.1.1 Impact before mitigation

During the operating phase, noise levels (mainly related to the take-offs and landings of larger air carriers) may be considered disturbing to the surrounding populations.

Some individuals of the receptor village communities have indicated in an informative way a potential sensitivity to the impact of these noise disturbances without attributing to them any real significance.

The impact severity is not significant. Considering the receptor sensitivity assessed as low, **the impact magnitude is negligible.**

No mitigation measures of this impact will be taken.

The proposed measures result in a not significant severity mitigated impact. Thus, the residual impact is of **negligible magnitude.**

7.4.4.5.2 Summary

Table 127: Impact during Operation - Socio-Economic Environment – living environment & Landscape

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
SE-Liv-Op-1	Noise and sound pollution	Adverse	Negligible		No mitigation measures to be undertaken	Negligible

7.4.4.6 Induced impacts

The impacts induced by the project are the impacts that result from all or part of all the potential impacts identified during the various phases of project implementation.

With regard to the induced effects on communities directly and indirectly impacted by the proposed expansion of the airport runway, the main issue of the situation of the socio-economic environment is mainly based on agricultural and livestock breeding activities.

Directly impacted populations such as the villagers of Sainte Marie or the non-resident livestock breeders of Bangélique are still conducting farming and livestock activities with specific methods, which can be considered very extensive. Their involuntary displacement will inevitably lead to changes in their agricultural practices in order to make their activities viable, adapted to the environment, significantly different from their relocation zone.

The agricultural and livestock-related impacts described above present mitigation capacities in close connection with support measures by the relevant regional commissions. The guidelines of the Rodrigues Regional Assembly, aimed at pursuing a policy of sustainable development through ecological preservation initiatives, will most likely have an induction effect on the shaping of the operation and agricultural landscape of the island and especially the area of Plaine Corail.

Thus, in order to cope with the potential pressure of livestock on pasture surfaces and adapt new management methods to make agricultural activities viable as a whole, the integration of techniques according to the principles of agro-ecology is being proposed to meet the island's eco-sustainable development goals.

In this context, the potentially induced impacts will then be closely linked to the gradual implementation of the methods employed, for which the objective is to achieve a social, economic and environmental balance. These potentially induced impacts could be:

- **Revegetation of the agrarian space:** the integration of arboreal and other plant species is one of the conditions for the rehabilitation of soils in an environment, thus representing a positive impact induced by the need to adapt agricultural procedures (including livestock breeding) to the area. This revegetation also implies the participation of appropriate services such as those of agriculture but also of the environment. Indeed, some endemic plant species of the island can be integrated into the agricultural landscape. This revegetation also concerns pastures with the integration of species with high forage values (species already present on the island).
- **Intensification of livestock breeding:** livestock breeding methods will have to evolve in view of the potential increase in livestock in the area. The extensive livestock breeding methods will not be applicable or very difficult to apply. And the sequencing of the livestock breeding areas is to be expected, in particular to avoid straying of animals and plausible damage in the surrounding plantations. Animal husbandry linked to the advent of improved grazing areas will lead to a change in livestock breeding towards a less extensive management method than it currently is.

7.4.5 Air quality and noise

7.4.5.1 Air quality

7.4.5.1.1 Impact Air-Op-1: Deterioration of air quality due to increased airport capacity

7.4.5.1.1.1 Impact before mitigation

The aim of the project is to increase the airport's capacity, both in terms of traffic and aircraft type. The platform currently accommodates small ATR72 aircraft with 1,600 movements per year; in the long term, A320/A321 NEOs and B737-800s will land, with approximately 985 movements per year.

The consequence is a significant increase in pollutant emissions due to air traffic.

It should be noted that A320 NEO and A321 NEO are aircraft with lower fuel consumption compared to aircraft of the same type. As a result, their polluting emissions are reduced.

An increase in road traffic serving the airport is also to be expected, although it is not quantified at this stage. Pollutants emitted by road traffic will also increase. In the same way, the impact of airport activities excluding flights will develop (by a non-quantifiable amount).

The impact of operations is assessed by quantifying the polluting emissions of flights through the emissions inventory. The methodology is the same as that used for the baseline assessment.

Considering the traffic forecasts over the 15-year horizon after commissioning, the results are shown in the following table (based on default LTO cycle). The calculation made for the baseline is recalled for comparison.

Table 128: Emissions inventory

Emissions (kg/year)	CO emitted	HC emitted	NOx emitted	SO ₂ emitted	CO ₂ emitted	Fuel consumption (kg/year)
Baseline 2017	3 777	470	2 950	324	1 005 020	324 200
After commissioning (30-year average)	6 685	189	7 673	691	2 137 548	678 609

Between the base year and the future projection, the inventory shows emissions are roughly doubled for all pollutants, except for HC which are reduced by about forty percent. This is directly explained by the change of aircraft type using the platform, as B737 and A321 aircrafts are much more powerful (and therefore pollution emitters) than the AT72 type aircrafts. The A321 neo emit little HC, which explains the decrease in emissions for this pollutant.

The emissions inventory does not directly give the concentration of polluting substances in the atmosphere, but it allows the trend between two situations to be assessed. In the light of this calculation, it is clear that air quality will be degraded in the airport environment as a result of

the project. Greenhouse gas emissions and fuel consumption will follow the same trend as air pollutants.

Although the direction of the prevailing winds is favourable to the dispersion of pollution towards the sea, and the area is sparsely populated, the impact severity is judged high.

The impact severity is high. Considering the receptor sensitivity assessed as high, the impact magnitude is high.

7.4.5.1.1.2 Mitigation measure and impact after mitigation

Measures to reduce polluting emissions from aircrafts can only be taken in consultation with the airports authorities because they can have an impact on safety:

- If possible, limit the taxiing distance,
- Opt for technologies that limit aircraft pollutant emissions during taxiing, such as the use of a diesel - electric tractor for the taxiing of the aircrafts, which can then shut down their engines,
- Encourage pilots to shut down unneeded engines when taxiing,
- Limit congestion (aircraft queues) by making departures as fluid as possible,
- Minimize the use of the APU and GPU,
- Consider procedures to limit the use of the thrust reverser.

In parallel, and in view of the very significant increase in pollutant emissions, it seems essential to provide for regular monitoring of air quality around the airport (see chapter 9 Preliminary Environmental and Social Management Plan (ESMP)). Depending on the results, further investigations may be carried out, including modelling of the dispersion of pollutants, which will make it possible to monitor the effect of specific mitigation measures.

Other measures may help to limit pollution from sources other than aircraft:

- Make ecological performance a criterion of choice for service vehicles and ground equipment,
- Develop an efficient public transport system to limit the use of private vehicles.

As the feasibility and effectiveness of the proposed reduction measures is not quantifiable at this stage, the impact magnitude with mitigation measures is unchanged and still high.

The proposed measures result in a high severity mitigated impact. Thus, the residual impact is of high magnitude.

7.4.5.1.2 Summary

Table 129: Impact during Operation - Air Quality

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Air-Op-1	Deterioration of air quality due to increased airport capacity	Adverse	High	Air-Mit-6	If possible, limit the taxiing distance	High
				Air-Mit-7	Opt for technologies that limit aircraft pollutant emissions during taxiing	
				Air-Mit-8	Encourage pilots to shut down unneeded engines when taxiing	
				Air-Mit-9	Limit congestion (aircraft queues) by making departures as fluid as possible	
				Air-Mit-10	Minimize the use of the APU and GPU	
				Air-Mit-11	Develop and implement procedures to limit the use of the thrust reverser	
				Air-Mit-12	Make ecological performance a criterion of choice for service vehicles and ground equipment	
				Air-Mit-13	Develop an efficient public transport system to limit the use of private vehicles	

7.4.5.2 Noise

7.4.5.2.1 Impact Noi-Op-1: Noise impact due to increased airport capacity

7.4.5.2.1.1 Impact before mitigation

The aim of the project is to increase the airport's capacity, both in terms of traffic and aircraft type. The platform currently accommodates small ATR72 aircraft with 1,600 movements per year; in the long term, A320/A321 NEOs and B737-800s will land, with approximately 985 movements per year. The consequence is a significant increase in noise emissions due to air traffic.

It should be noted that A320 NEO and A321 NEO are aircraft with lower noise emissions than standard A320 and A321 aircrafts.

An increase in road traffic serving the airport is also to be expected, although it is not quantified at this stage. Road noise will therefore be higher than the current one. In the same way, the impact of airport activities excluding flights will develop (by a non-quantifiable amount) and certainly generate noise.

The new runway impact is assessed by calculating the noise curves, considering the traffic projected 15 years after the inauguration.

The hypotheses are as follows:

- only airborne noise is considered, as it is predominant,
- the ground topography has not been taken into account,
- traffic has been assigned to the runways based on the data available at this stage (inauguration + 15 years); similarly, the hourly distribution is based on current movements,
- at this stage, flight procedures are imprecise and based on approximations.

Since the distribution of traffic during the night period is not precisely known, the analyses focused only on noise levels during a full 24-hour day and not specifically on the night period.

The resulting noise contours around the airport are represented on the map below, indicating the presence of population; thus, this map illustrate the exposure of populations to future aircraft noise.

**New Runway of Plaine Corail Airport
AIRPORT NOISE CONTOURS - PROJECT**

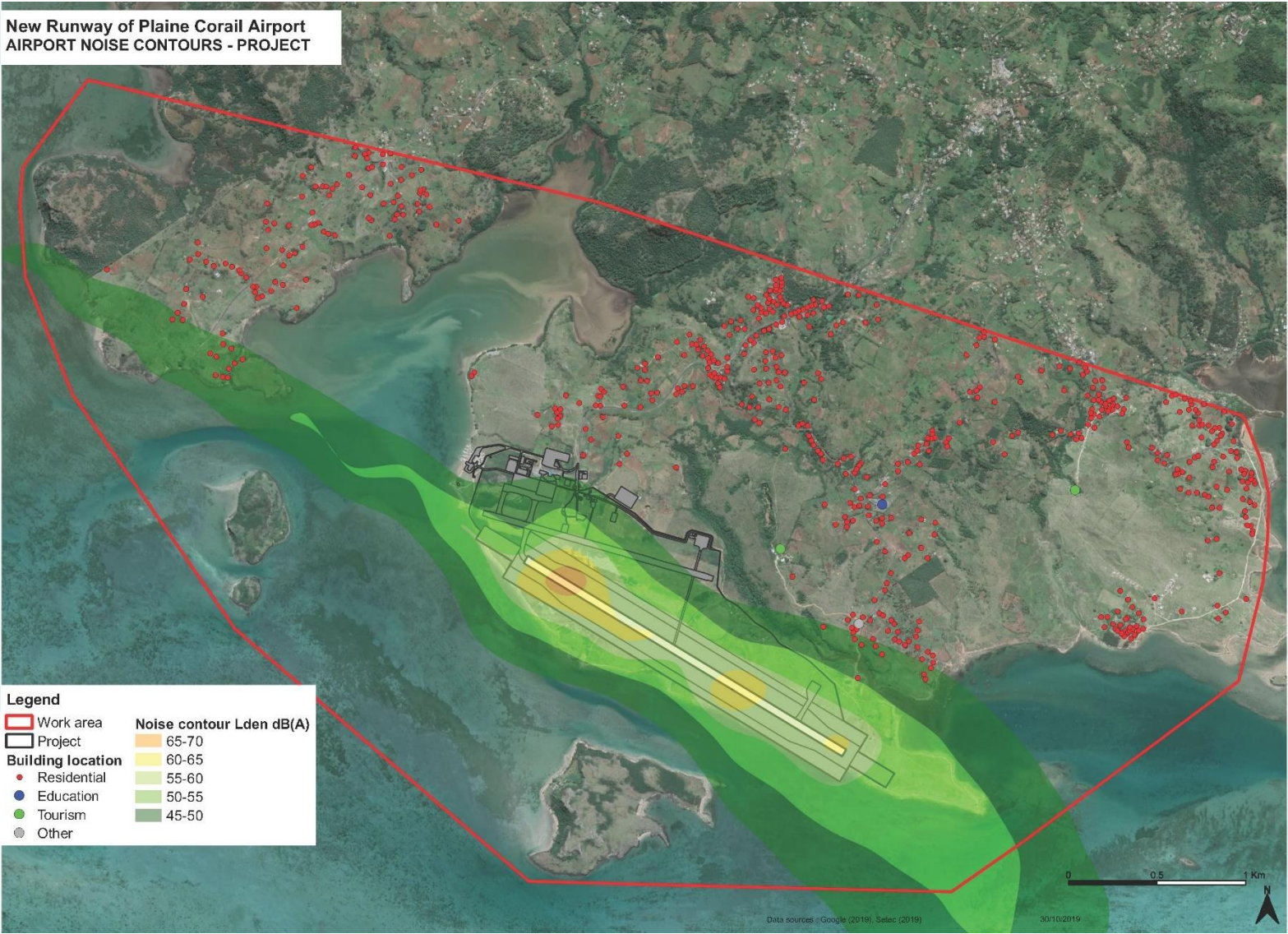
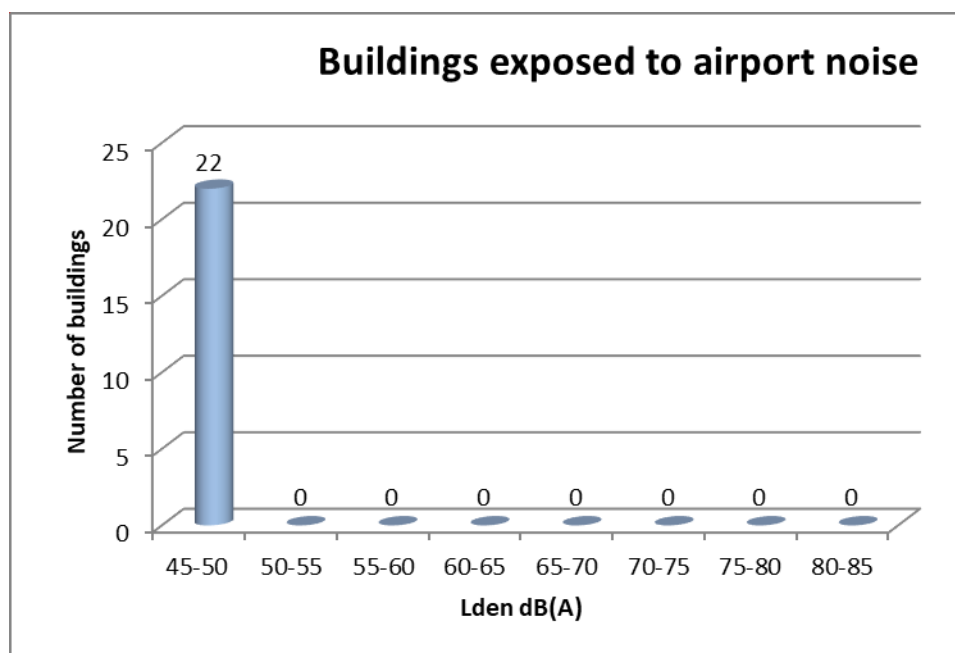
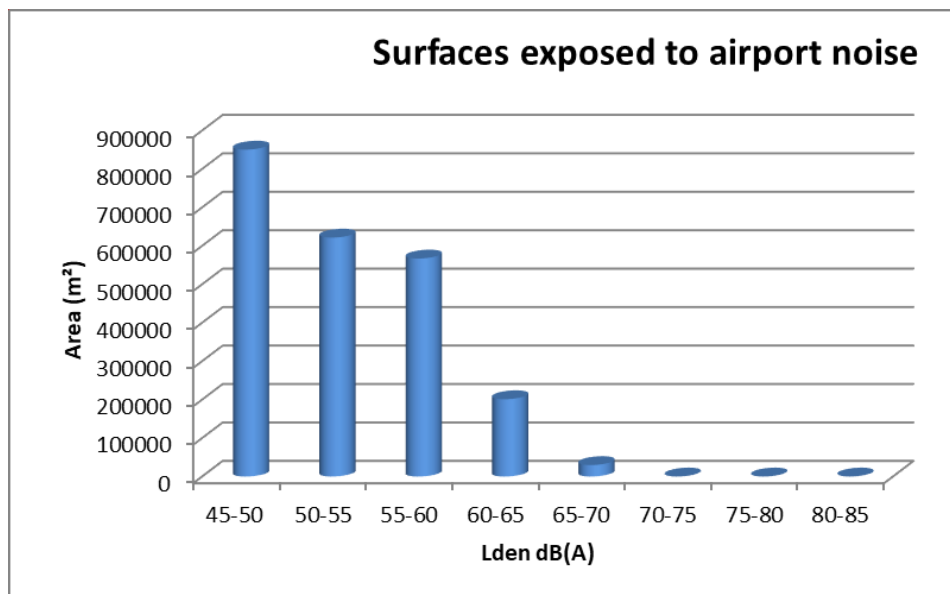


Figure 182: Airport contours - operational phase

The following table shows the distribution of surfaces, noise sensitive buildings and noise exposed populations by noise level range. It is estimated that the number of inhabitants per household is three.

Table 130: Noise exposure within Lden contours

included in Lden contour (dB(A))	45-50	50-55	55-60	60-65	65-70
Noise-sensitive buildings	22	0	0	0	0
Populations	60	0	0	0	0
Area (m²)	850278	621513	567050	201082	29780



The map and these results show that about 20 buildings will be exposed to noise levels above 45 dB(A), which is the threshold recommended not to be exceeded by the WHO. It is to be

noted that French regulations consider that noise exposure is strong from 62 / 65 dB(A). No building has been identified within this Lden contour. It is to note that areas within the contour 60 dB(A) hardly exceed the airport boundaries.

Noise exposure is considered moderate from 55 / 57 dB(A); within this Lden contour, no houses have been identified.

The south of the island is sparsely populated, however, about 20 buildings will be affected by aircraft noise, while exposure to noise is currently very limited.

Thus, the **impact severity is high**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is medium**.

7.4.5.2.1.2 Mitigation measure and impact after mitigation

The runway alignment, and approach and departure paths are already rather favourable because they limit overflying of populated areas. In addition, the majority of aircraft that will fly on the platform are A320/A321 neo, less noisy than conventional A320/A321.

It is difficult to reduce the impact of aircraft noise. However, some noise reduction measures can be reviewed:

- limit traffic at night as much as possible. The use of any noisy equipment, such as engine ground run-ups, should also be limited to safety reasons during night time,
- limit the use of reverse thrust if not needed for safety reasons (reverse thrust is used to slow down an aircraft and generates high noise levels),
- usually, the descent angle for landing with ILS is 3 degrees (glide slope). It may be considered to raise the ILS glide slope (up to 3.5 degrees maximum) as it reduces slightly the noise emissions during landing,
- specific departure procedures can be adopted to minimize noise exposure on the ground.

The last two measures aim at allowing aircraft to approach at higher altitude and to reach high altitude quickly when leaving the airport, in order to reduce noise exposure of nearby residential areas.

The strengthening of house insulation, as practiced in Europe, is not retained as a measure to compensate for overexposure of noise, because it is only useful when people spend most of their time inside houses with closed windows, which is not the case in Rodrigues.

Another measure may help to limit noise pollution from road traffic:

- Develop an efficient public transport system to limit the use of private vehicles.

The measures described above may reduce the impact of aircraft noise, but they cannot be quantified at this stage and their feasibility is to confirm. Thus, the mitigated impact is unchanged.

The proposed measures result in a **medium severity mitigated impact**. Thus, **the residual impact is of medium magnitude**.

In addition, it is recommended to set up land use management in the area affected by airport noise, in order to control the development of urbanization and not to increase the populations exposed to noise. Following the example of the French urban planning rules, the procedure can be as follows:



- assess which areas are affected by airport noise, based on long-term projections,
- define construction rules according to the expected intensity of the nuisance. For instance, prohibit the construction of schools or houses in the most affected areas and encourage the establishment of industrial and commercial buildings,
- control the evolution of noise levels by setting up a noise monitoring system, and adapt noise mitigation measures if needed.

It is also strongly recommended to inform the public about the influence of the airport on the noise environment. Indeed, providing information and enabling people to establish communication with airport authorities can help improve their feelings about aircraft noise. It is also important to show people that efforts are being made to limit the impact of airport activities on their living environment.

7.4.5.2.2 Summary

Table 131: Impact during Operation - Noise

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Noi-Op-1	Noise impact due to increased airport capacity	Adverse	Medium	Noi-Mit-3	Limit air traffic at night and the use of noisy equipment	Medium
				Noi-Mit-4	Raise the ILS glide slope to reduce noise emissions during landing	
				Noi-Mit-5	Adapt departure procedures to minimize noise exposure on the ground during take-off	
				Noi-Mit-6	Limit the use of reverse thrust	
				Noi-Mit-7	Develop an efficient public transport system to limit the use of private vehicles	

7.4.6 Heritage resources and visual environment

7.4.6.1 Paleontology

None.

7.4.6.2 Landscape and visual environment

7.4.6.2.1 Impact Vis-Op-1: alteration of the living environment

7.4.6.2.1.1 Impact before mitigation

The airport extension will result in traffic flow and economic growth. Local landscapes will be undergoing a rapid change.

Sources of impact associated with the exploitation phase may include:

- Permanent earthworks;
- Construction of airport buildings and airport infrastructures;
- Road traffic and air traffic increase;
- Airport inner traffic;
- Road development;
- Touristic infrastructures development (hotel, golf course, compound, marina, etc.);
- Urban development.

The coastline is a very attractive landscape with highly valued and untouched features. In history, natural environments have been severely degraded and modified. But touristic development impacts on the coast are unprecedented in Rodrigues.

Takeoff, landing and aircraft approach might be seen as a positive addition in local residents' daily life. It is unsure if direct view on runway and airport infrastructures bring an equal excitement. From a tourist perspective, in search of an authentic and relaxing experience, it does clearly represent a nuisance.

General sensitivity to alteration of the living environment of main landscape features can therefore be considered high.

There is a high probability for those impacts to occur.

Change in coastline and built surfaces is a permanent loss to key elements of the landscape character, which results in fundamental change.

The **impact severity is major**. Considering the **receptor sensitivity assessed as high**, **the impact magnitude is major**.

7.4.6.2.1.2 Mitigation measure and impact after mitigation

A series of mitigation measures will help to minimize the landscape and visual impacts of construction activities. These measures will be:

- For airport buildings and infrastructures to reach architectural quality and soundness;
- Permanent fences and earthworks will be arranged to reduce visual intrusion on neighboring homes;
- Plantings (trees and bushes) will be designed and arranged to form visual screens to mitigate visual impacts from nearby roads and homes; location of hedgerows along ravines and tree lines along main roads to reinforce landscape character. Early planting needed for efficient screening when construction works starts; Screen planting does

contribute to construction acceptance and generally speaking planting contributes to a positive perception of the construction phase;

- Touristic infrastructure to respect scale of Rodrigues' landscape and sense of place;
- Urban development to foster the development of public places and public amenities.

The mitigation planting has been mapped. Most of it takes place inside the 500m perimeter. That is where receptors are most sensitive to change and where visual mitigation is the most efficient.

5m high vegetation (shrubs) and 10m high vegetation (tall shrub and small trees) have proved to be widely insufficient to screen views to the new runway.

20m (forest trees) is the appropriate size to screen views to the East of the airport – which is the most significant part of impacted settlements. Plantings will take the shape of little woodlands on both sides of Anse Quitar.

30m high (tall trees) is hardly sufficient to screen the entire runway from residents located west and south of the airport. Coastal vegetation is to form little woodlands, hedgerows and thickets there. It would prove more efficient if combined with a landscape earthwork (to raise vegetation).

All planting will be combined with the terrestrial habitat reduction measures: BioT-Mit-3, BioT-Mit-5, and BioT-Mit-7. Also it should be combined with fast growing species (eg; coco tree in coastal planting).

Those mitigation measures will limit the landscape impact to a high change.

There is a risk on living environment of considering visual and aesthetic measures as secondary or unnecessary.

The proposed measures result in a **major severity mitigated impact**. Thus, **The residual impact is of high magnitude**.

7.4.6.2.2 Impact Vis-Op-2: alteration to landform outside the airport

7.4.6.2.2.1 Impact before mitigation

Outside the airport itself, indirect impact might occur as a medium to long term effect. Induced development might have a strong visual impact due to the very marked topography of the island, the very cut-out reliefs, and rare flat areas. The relative importance of earthworks and engineering structures is therefore a determining factor here. Economic and touristic growth might result in large urban development projects or new infrastructures.

Related landscape issues are as follows:

- A controlled change of scale in the urban fabric;
- A new type of building size and architecture to fit the local sense of place;
- The preservation of ridges, as they are the horizon of most landscapes in Rodrigues (issues: freezing of urbanization on ridges, installation of afforestation...)
- The preservation of plains and ravines (challenges: maintaining natural areas, strengthening a green and blue framework, creation of visual screens, etc.)

- Soil erosion: In Rodrigues, the corollary of all human activities is soil erosion, as the environment is so fragile. This impact will also be felt after the works are completed (challenges: control of land clearing linked to urbanization, adaptation of the works according to the seasons and rainfall, control of site residues, control of the layout and execution of site tracks, treatment of slopes or other supports, plant engineering strategies...)
- Control of quarry zones: On the island, quarry activities are likely to be poorly controlled. Depending on the material balance and earthworks requirements, the supply of backfill materials will have immediate impacts on landscapes near large urban development projects or new infrastructures.
- Landscape integration of surplus material disposal areas (issues: choice of disposal sites, work on models, and restitution to agriculture or forestry of certain peripheral backfill areas, etc.)

Natural environments and landscapes might get more degraded and modified.

General sensitivity to pressure increase on island landscape can be considered medium.

Indirect impacts have low to moderate chances to occur, as local awareness seems to rise.

Loss of elements of the landscape character, or alteration to key elements of the landscape character, might result in partial change of landscape character.

The impact severity is medium. Considering the receptor sensitivity assessed as medium to major, the impact magnitude is medium.

7.4.6.2.2 Mitigation measure and impact after mitigation

The program of action of SIDS (Small Island Developing States) sets actions to be promoted at the national, regional and international levels in order to ensure the viability of the tourism sector and its harmonious development within the cultural and natural endowments in place.

Yet, SIDS Development Policy Framework has to develop into local action plans.

Four types of mitigation measures will help to minimize the landscape and visual impacts of exploitation activities:

- Establishment of local Urban Development Master Plan to monitor urban development related to tourism growth, to value and enhance the local landscape; those master plans concern the communities in the vicinity of the 12 public beaches and other locations identified in the PASIDS tourism master plan;
- Set up of green and blue grids to help strengthen the national policy for natural resource conservation;
- Set up of sustainable and resilient city guidelines and architectural guidelines;
- Community support in construction process.

Rodrigues' environment and landscape are altered and fragile. These mitigation measures will permit the limitation of the magnitude of the impact to a low level. The three regulatory framework measures might create or improve conditions of attracting and promoting tourism in Rodrigues.

The proposed measures result in a medium severity mitigated impact. Thus, The residual impact is of low magnitude.

7.4.6.2.3 Impact Vis-Op-3: alteration to the island forest cover

7.4.6.2.3.1 Impact before mitigation

Outside the airport itself, indirect impact might occur as a medium to long term effect. Induced development might as well have a strong visual impact due to woodland cutting.

The island of Rodrigues has the particularity of being almost entirely green. Although the natural woodlands of the hillsides are already much degraded, a forest environment persists. This atmosphere is at the same time an asset in terms of sustainable development and quality of life, and an issue for the landscape quality and identity of the island.

The building industry must be able to be provided timber from sustainable planting, with long term management.

Native flora of significance that has been observed on site will require various levels of protection and mitigation from construction impacts and from the introduction of exotic plants.

The impact severity is medium. Considering the receptor sensitivity assessed as high, the impact magnitude is medium.

7.4.6.2.3.2 Mitigation measure and impact after mitigation

Four mitigation measures will help to minimize the landscape and visual impacts on the island's forest cover:

- Investment in woodland planting to feed the timber industry;
- Set up a sustainable timber management plan;
- Set up of green and blue grids to help strengthen the national policy for natural resource conservation;
- Ravine preservation and sanctuarisation of associated woodlands. By strategically expanding these existing forest communities, landscape measure Land-Mit-9 proposing to add a sizable new area of planting to an already well-established area, they will collectively become an enhanced sanctuary for indigenous species to thrive in.

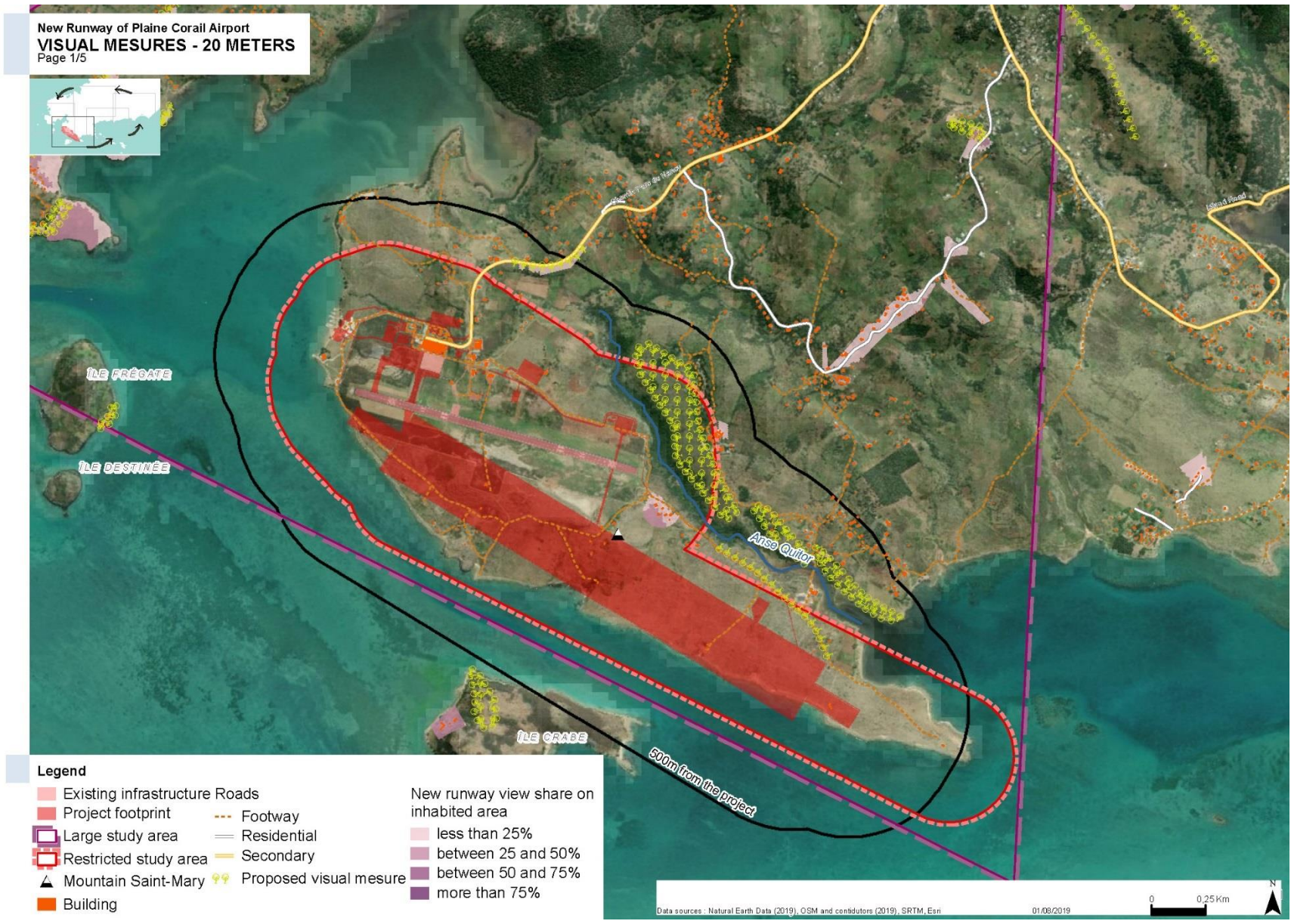
Rodrigues' environment and landscape are altered and fragile. These mitigation measures will permit the limitation of the magnitude of the impact to a negligible level. It might result in a positive effect if the the island's forest cover expands.

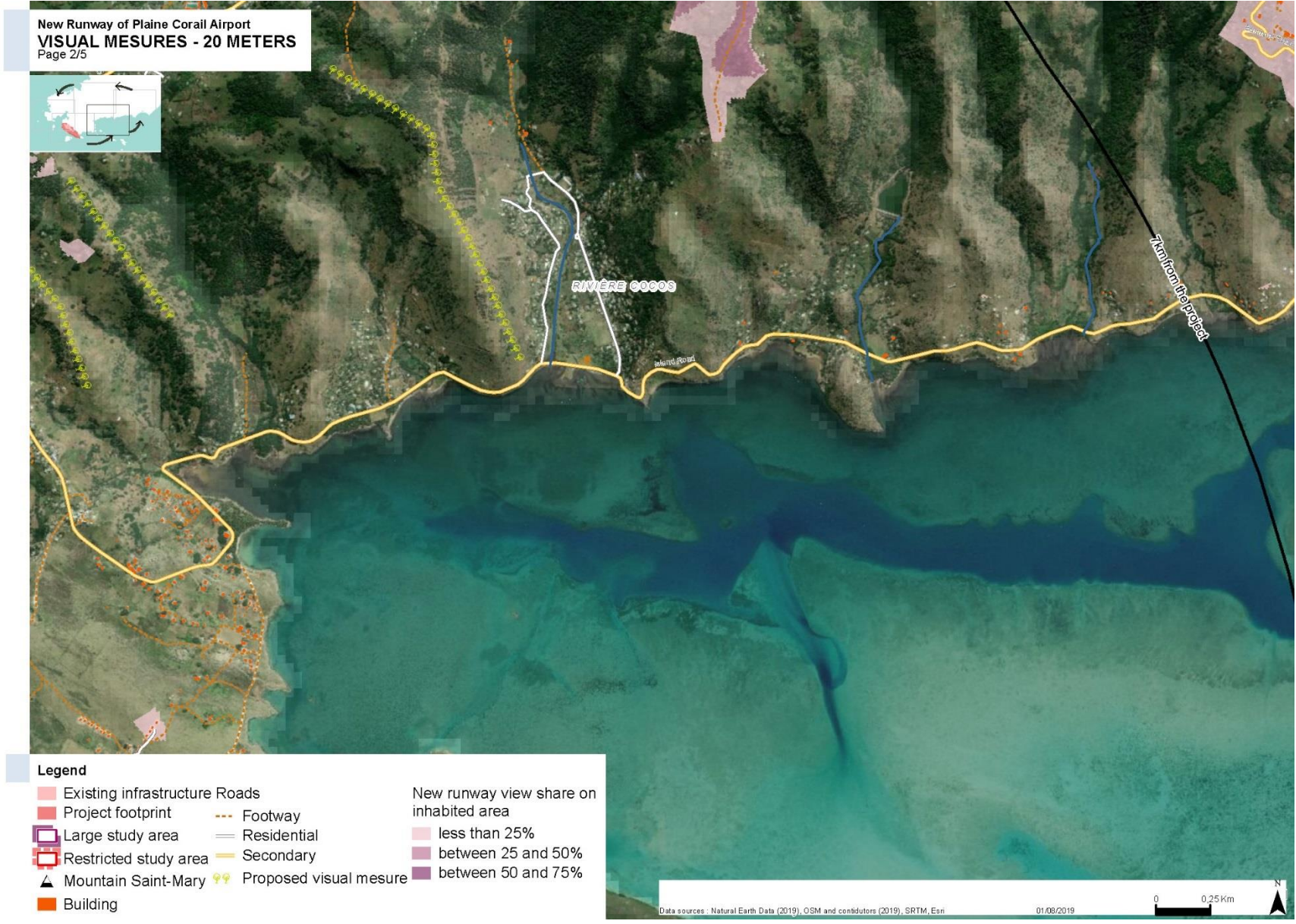
The proposed measures result in a not significant severity mitigated impact. Thus, The residual impact is of negligible magnitude.

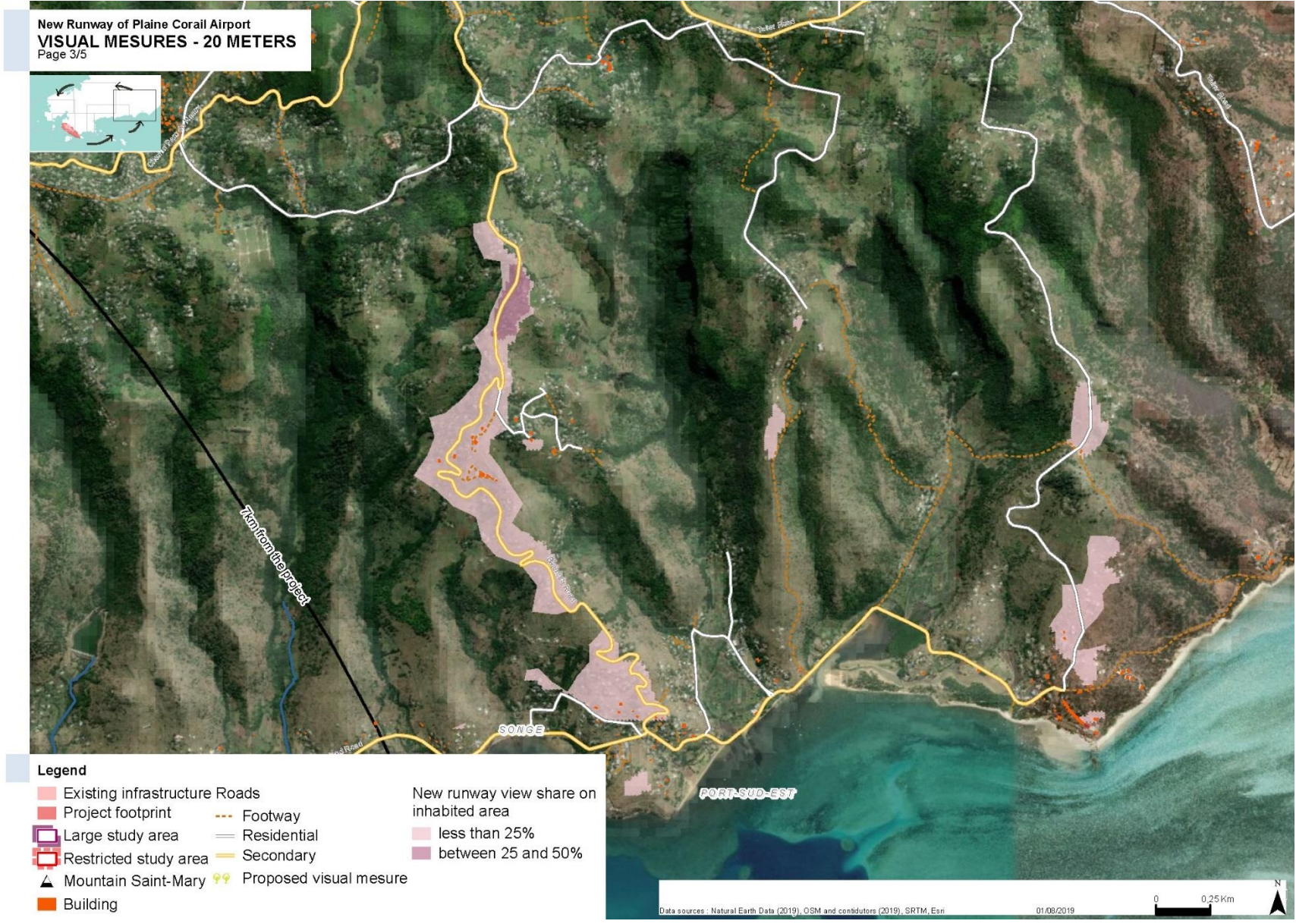
7.4.6.2.4 Summary

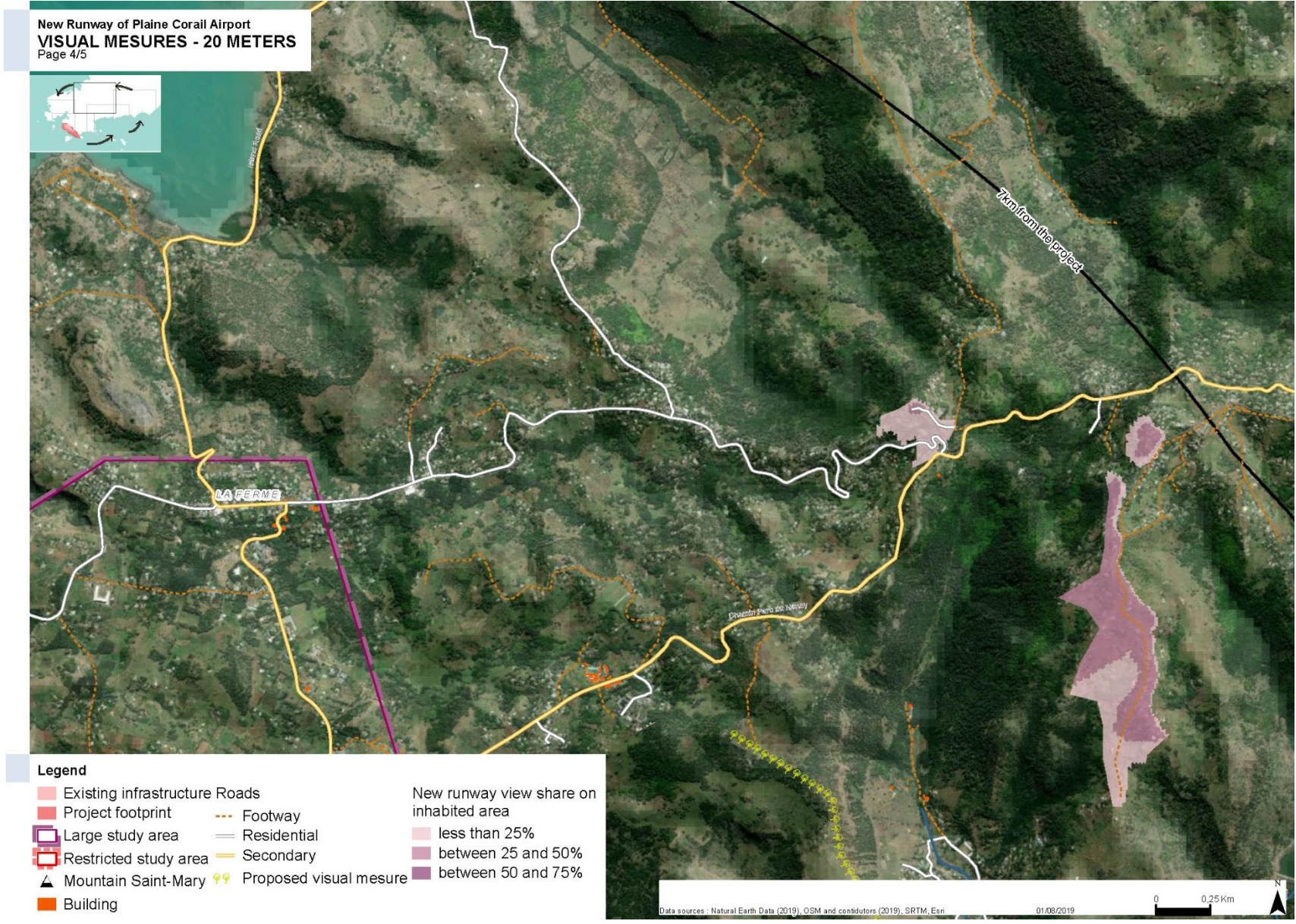
Table 132: Impact during Operation - Visual Environment & Landscape

Impact ID	Impact name	Direction	Impact magnitude mitigation	Measure ID	Avoidance / Mitigation / Compensation / Improvement Measures	Residual / improved impact magnitude
Impact Vis-Op-1	Alteration of the living environment	Adverse	Major	Land-Mit-15	Airport buildings and infrastructures to reach architectural quality and soundness;	High
				Land-Mit-7	Permanent fences and earthworks will be arranged to reduce visual intrusion on neighboring homes	
				Land-Mit-9	Plantings will be designed and arranged to form visual screens to mitigate visual impacts from nearby roads and homes; location of hedgerows along ravines and tree lines along main roads to reinforce landscape character. Early planting needed for efficient screening when construction works starts	
				Land-Mit-16	Touristic infrastructure to respect scale of Rodrigues' landscape and sense of place	
				Land-Mit-17	Urban development to foster the development of public places and public amenities	
Impact Vis-Op-2	Alteration to the landform outside the Airport	Adverse	Medium to major	Land-Mit-18	Establishment of local Urban Development Master Plan to monitor urban development related to tourism growth, to value and enhance local landscape	Low
				Land-Mit-19	Set up of green and blue grids	
				Land-Mit-20	Set up of sustainable and resilient city guidelines and architectural guidelines	
				Land-Mit-13	Community support in construction process.	
Impact Vis-Op-3	Alteration to the island's forest cover	Adverse	Medium	Land-Mit-21	Investment in woodland planting to feed the timber industry	Negligible
				Land-Mit-22	Set up a sustainable timber management plan	
				Land-Mit-19	Set up of green and blue grids	
				Land-Mit-23	Ravine preservation and sanctuarisation of associated woodlands.	

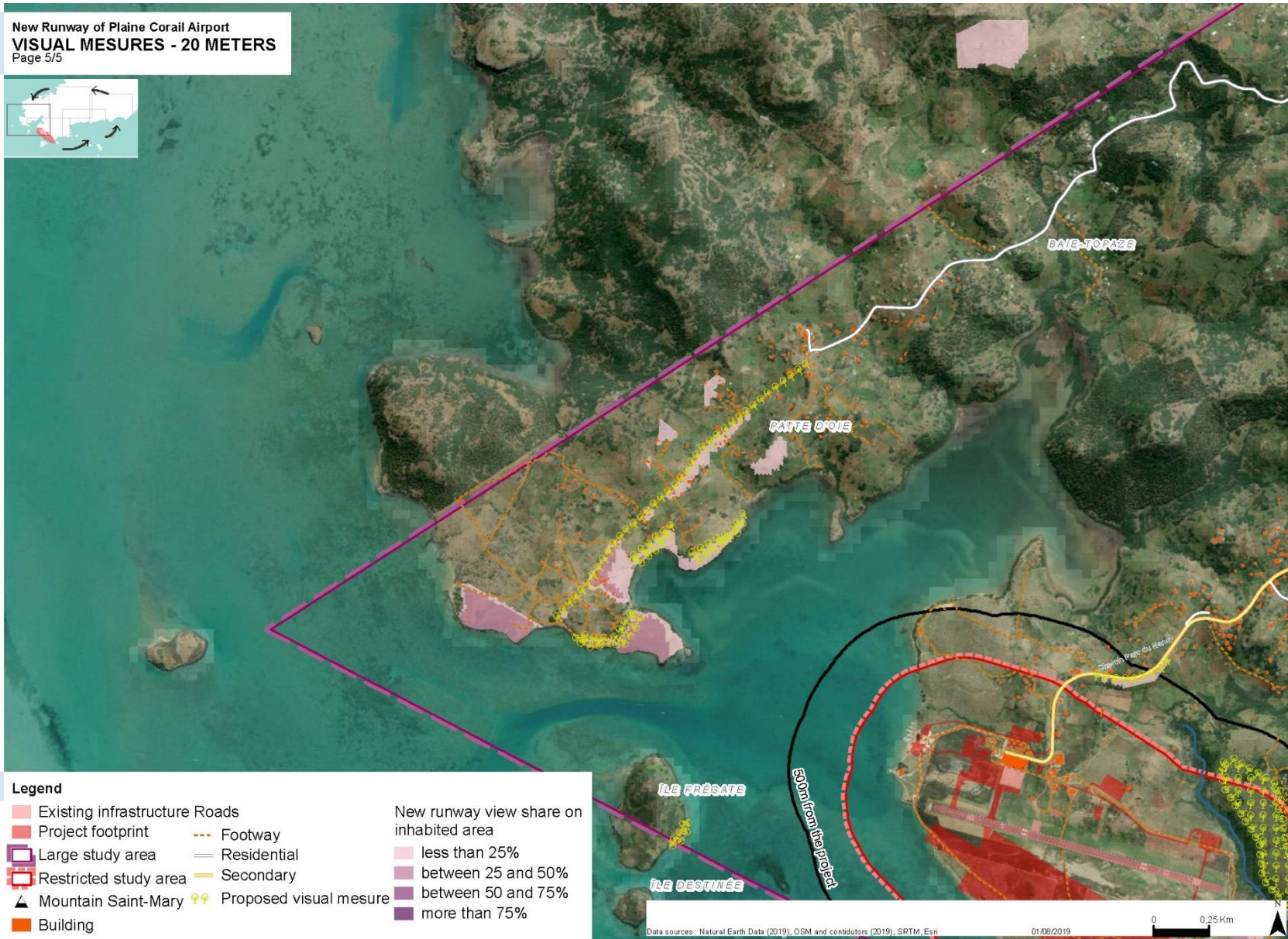
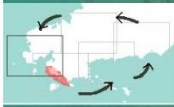








New Runway of Plaine Corail Airport
VISUAL MESURES - 20 METERS
Page 5/5



Legend

- | | | |
|-------------------------------|------------------------|---|
| Existing infrastructure Roads | Footway | New runway view share on inhabited area less than 25% |
| Project footprint | Residential | between 25 and 50% |
| Large study area | Secondary | between 50 and 75% |
| Restricted study area | Proposed visual mesure | more than 75% |
| Mountain Saint-Mary | | |
| Building | | |

8 Project alternatives

8.1 Brief description of the approach to designing the best development solution

Since the administration of Rodrigues decided to improve air access to the island by developing the existing airport, two phases of study were carried out:

- a feasibility study aiming to determine if the new runway project was technically and economically sound, and which development alternative to pursue;
- a preliminary design aiming to finalize the selection of the development alternative and to establish the first drawings and dimensions.

The feasibility studies carried out by ECORYS in 2011-2012 aimed to propose various development solutions to improve the current operation of the airport.

Four development alternatives were ultimately proposed. These alternatives ranged from a simple improvement of the current operation of the airport to the extension of the existing runway. Runway extensions, both seaward and landward, were proposed.

The local administration selected the seaward extension of the runway, based on the assumption that the project would not adversely impact the landscape and the karst system. GIBB began to study such options in order to establish a preliminary design for a seaward extension.

A precise bathymetry showed that the seabed was much deeper than expected which resulted in the rejection of the seaward alternative. Therefore, a landward development solution was selected.

8.2 « Doing nothing »: maintain the current arrangements for the foreseeable future

The existing facilities are providing a service that meets most of the current needs of the island during non-peak periods.

However, during the peak period, the maximum of twelve flights per day is not sufficient to meet demand. The current capacity is over-stretched.

Furthermore, the Assembly of Rodrigues wishes not only to meet the current demand but also:

- To allow aerial cargo in order to increase agricultural income from the export of fresh products and to move away from total dependence on boat supply;
- To foster an increase in tourism with the goal of welcoming up to 100 000 tourists per year by 2025 (from 78 000 tourists per year in 2018).

The lack of tourism development and associated cash inflows may lead the population to increase agricultural activity, which is the main source of income on the island. Any significant increase in the agricultural footprint on the island would almost certainly entail soil and biodiversity degradation. As actions undertaken by the local administration and some associations aiming to enhance the island's natural assets are limited in scope by the lack of funding, conservation could be significantly improved with better funding and linkages to the

tourism industry. Limiting the island's tourism development and pursuing agricultural income could, therefore, contribute to limiting the administration's capacity to reclaim the island's natural resources and to preserve its biodiversity.

8.3 Improving the current situation by facilitating the unrestricted operation of the ATR72 aircraft

Currently, the biggest aircraft that can be accommodated at Plaine Corail Airport is the ATR72. The ATR72 suffers a weight restriction due to the presence of the Frégate Island, which constrains the approach to the runway. For this reason, the ATR72 may only transport 64 passengers out of the 72 available seats, and luggage delivery sometimes encounters difficulties.

This option provides sufficient development to enable the ATR72 aircraft to operate with no restriction on passenger numbers or take-off weight; other than those restrictions specified by the manufacturer or applied by the airline for other reasons.

To lift the current restrictions, a slight increase in the runway length is needed, such that the weight of the aircraft becomes the constraining factor rather than the airport facility itself.

A 50m long extension into the lagoon was considered. This extension would be created on mass fill. The extension would cover the current perimeter roads, which would be put into a tunnel, and would require the relocation of the approach lighting installations.

No new structures, such as aircraft hangars, nor changes to the fuel farm were required for this option.

This option, called a "no regret option" as it could have been a first step of development before greater work, was rejected because the civil aviation authority judged the option to be unsafe.

Nonetheless, the increase in capacity associated with this option would not have been sufficient neither to meet current nor projected demand, nor to meet the development goals. This option would also have failed to allow cargo development.

8.4 Extension on the sea to the west

At the end of the feasibility studies it was decided to explore further the solution of seaward extension of the runway.

April 2016 - GIBB (Mauritius) Ltd (GIBB) was commissioned by the Rodrigues Regional Assembly (RRA) to develop the design for extending the runway into the sea based on 2 structural options, following the feasibility study of 2011 (Ecorys Report): a rubble mound structure with land infill as one option and an elevated reinforced concrete structure as the second option.

Geotechnical investigations at sea showed that bedrock was found at 60m compared to the expected foundation depth of 25 to 30m (the assumed depth used for cost estimation). The fill material or aggregate required for either options of extension into the sea (stilts or embankment) would not be available in the vicinity of the airport and possibly not in Rodrigues. For instance, it was estimated that fill material from Mt Croupier and Mt Topaze amounts to 3.0 million m³ while the required fill for the embankment option was 4.0 million m³.



This option would have caused a dam effect on the inlet separating the Frégate island from the Plaine Corail shoreline, with a significant impact on the marine physical and natural environment.

Consequently, given the expected impacts in regard to fill material, environmental impact due to earthwork and disturbance of marine currents, expected technical challenges and high costs associated with the runway extension into the sea, the RRA decided not to proceed with any of the runway extension options into the sea and subsequently amended the Consultant's Terms of Reference to prepare the Preliminary Design for a new Land Based Runway which consists of the design of a new 2,100m long runway with connecting taxiways and apron expansion suitable for Airbus A321 series as the design aircraft.

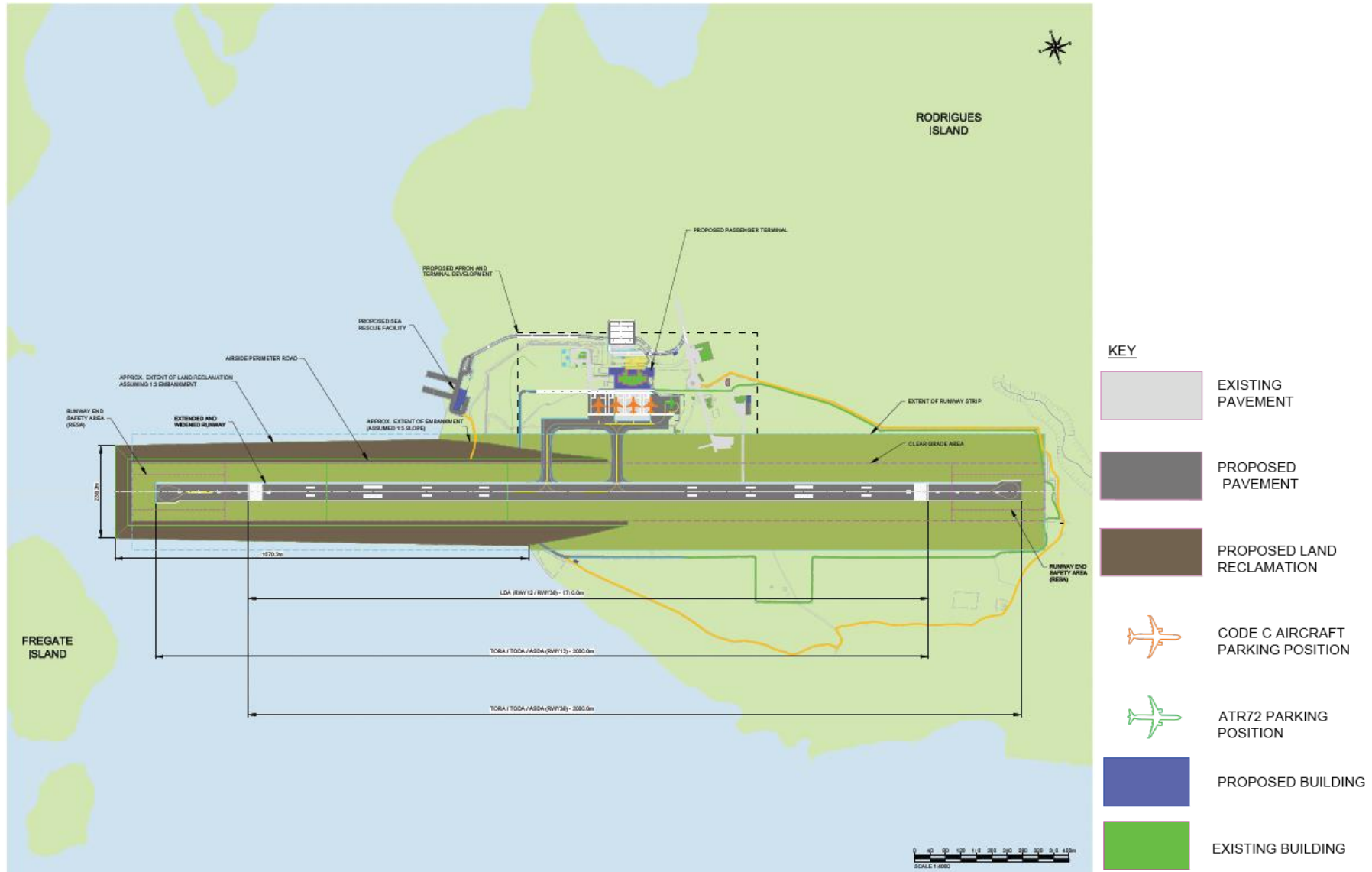


Figure 183: Map of “on sea” option with embankment or stilts (GIBB, 2016)

8.5 Resumption of studies to design a new runway to the southeast and Preliminary design

8.5.1 New runway options

Given the infeasibility of seaward extension of the existing runway, the preliminary studies focused on developing a new runway on earth.

December 2017 – GIBB submitted the “New Runway Options Report” to present to the RRA the different new runway alignment options and the required associated facilities, including budget estimates.

Six options (A, B, C, D, F, and G) were developed and judged according to several criteria. Among the six options, two distinct groups are distinguishable:

- Options for avoiding construction at sea;
- Options for avoiding earthwork on Sainte Marie Hill.

The options were compared based upon the following criteria:

- Volume of earthworks and balance between cut and fill:
- importing fill material, in the event of insufficient reusable excavated material, implies impacts on the site where the embankment materials are collected;
- impacts on roads and traffic all over the island due to transportation of cut or fill;
- transportation of the materials from or to the work site implies an increase in road or sea traffic, with associated local impacts on air quality, noise, and movement of people;
- impacts on extraction quarry or on the landfill receiving the excess material;

Option A needs to import more than 8.3 million m³ of fill material, B needs to import 1 million m³ of fill material, C achieves the equilibrium or generates 10 % m³, D needs 1.25 million m³ of fill material and F and G need to import 5.8 million m³ of fill material.

Only one option, Option C achieves equilibrium between cut and fill and avoids earthwork impacts or generate a little cut material. All other options need to import very significant volumes of fill material, with a significant impact on environment on the quarries sites and linked to the material transportation to the airport project site.

- Impact on Sainte Marie Hill:
- since the beginning of the project, the Rodrigues Assembly has paid particular attention to impacts on the landscape and the natural and agricultural land surrounding the airport, and has preferred development at sea rather than on land;

Only the options that block the channel (D, F, and G) or significantly build on the sea (A) make it possible to maintain Sainte Marie Hill.

- Impact on the sea:
- the embankment and sea defense wall needed to build on the sea have an impact on the seabed and marine life living, feeding, breeding, resting or passing through this zone;
- the embankment and sea defense wall also have an impact on the marine currents and the hydro-sedimentary functioning of this part of the lagoon;

- the embankment on the sea reduces or blocks, depending on its configuration, the Bangelique channel, impacting the fishing and shipping activities in this zone.

⇒ **Only one option, Option C, which impacts Sainte Marie Hill, avoids any work on the sea. Option B also has very little impact on the sea.**

- Conservation of the airport building, existing runway, and other facilities:
- Options that do not require the construction of an entirely new building, apron and taxiway have less impact on the land and environment and reduce the cost of the project;

Options C, D and F retain the existing buildings and apron. Options D and F need a very long taxiway close to the shoreline. Only Option C allows the existing runway to be reused as a taxiway.

- Maintaining the current airport operational during the work:
- Air access is now vital for Rodrigues Island and interruption of operations during construction would have a significant impact on the island's people, life and economy.

Only one option, Option A, significantly impacts the existing airport during construction.



Figure 184: Options for avoiding construction on the sea

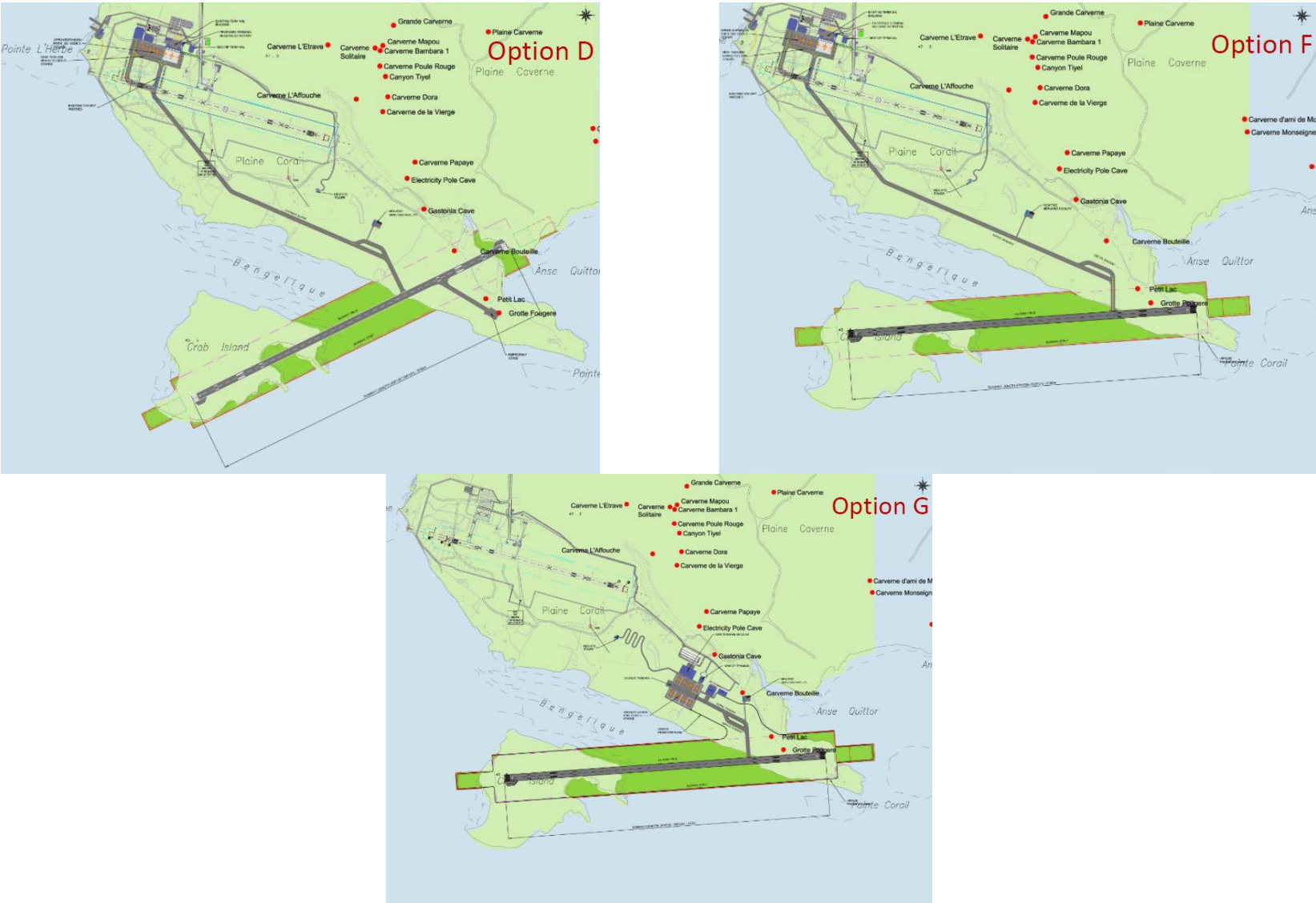


Figure 185: Options for avoiding Sainte Marie Hill



Option \ Criteria	Cut and fill + if equilibrium - - if import of fill - x if excedent of cut	Impact on Sainte Marie Hill + if saved - - if razed	Impact on the sea + if not impacted - - if channel blocked or significantly impacted x if low impacted	Impact on the existing infrastructures + if reused - - if impacted x if not impacted	Impact on airport operation during works + if operation not impacted - - if operation disturbed	Scoring and Ranking
A	-	+	-	-	-	1+ / 4- / 0x => -3 5th
B	-	-	x	-	+	1+ / 3- / 1x => -2 4th
C	+	-	+	+	+	4+ / 1- / 0x => +3 1st
D	-	+	-	x	+	2+ / 2- / 1x => 0 2nd ex aequo
F	-	+	-	x	+	2+ / 2- / 1x => 0 2nd ex aequo
G	-	+	-	-	+	2+ / 3- / 0x => -1 3rd

Only one option, Option C:

- achieves an equilibrium between cut and fill,
- avoids impacts on the marine environment,
- retains the most existing facilities,
- and allows the airport to remain operational during the works phase.
-

Hence the Option C was chosen to be developed during the Preliminary Design.

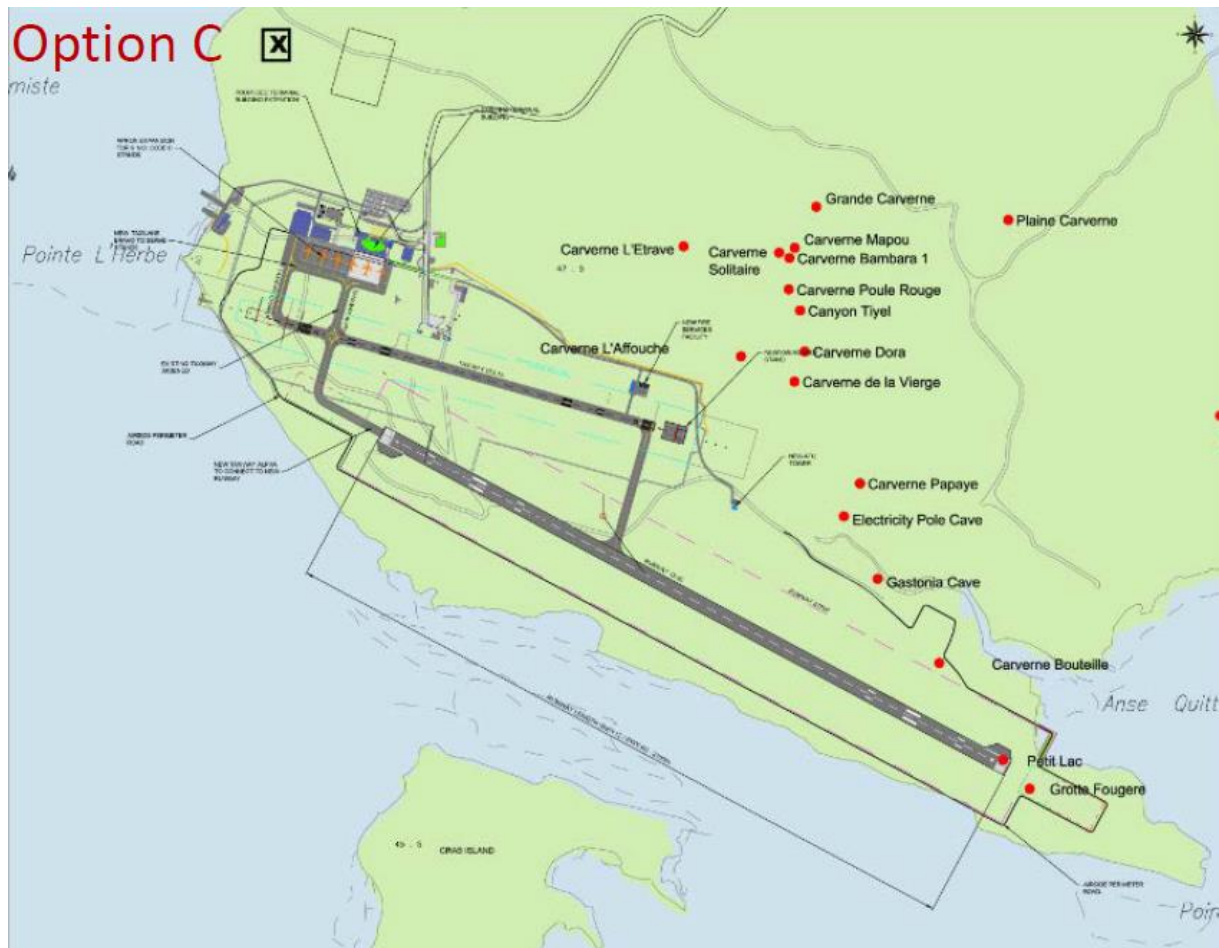


Figure 186: Option C chosen as base to establish the Preliminary Design

8.5.2 Preliminary Design optimization and new options

8.5.2.1 Changing footprint of the runway to avoid impact on open-air caves

During the elaboration of the Preliminary Design, based on Option C, the selected solution was optimized to spare the karst system as much as possible and, in particular, the two open-air caves called Petit Lac and Grotte Fougère. The rationale to change the footprint of the runway – as compared to the Option C (Dec 2017), was to avoid Cave Fougère and Petit Lac. With this change, additional marine works are required.

8.5.2.2 Taxiway or access road for fire fighting

Also, three options were considered for the connection between the new and the existing runway, including a flat taxiway D, a sloped taxiway D, or no taxiway D but an access road from the fire station.

The Preliminary Design Report was submitted by GIBB in November 2018, with preliminary cost estimates, excluding VAT, for two options compiled, as follows:

- **“Option 2” at MUR. 4,405,014,619.00**, provides for a new Taxiway D connecting the new runway to the existing threshold 30 with the maximum allowable ICAO compliant slope of 1.5% for the taxiway.
- **“Option 3” at MUR 3,923,013,815.00**, does **not** provide for Taxiway D linking the new and existing runways, but replaced by an access road for the fire tenders to travel from the ARFFS station to the new runway.

** (Option 1 was rejected).*

As per GIBB, the difference in cost is due to the fact that for Option 2, adequate volume of fill material could not be generated from within the site under the project area, as there was a shortfall of fill of about 1,000,000 m³, in order to allow for the slope for the Taxiway D.

Major difference is due to the fact that the fill material after the geotech investigation has a compaction ratio of 0.7 due to the presence of calcarenite (porous material).

Consequently, the Option 3 (without Taxiway D) was chosen and scope of works and estimates used for further studies, some of which were specifically requested by the funding agencies.

Although it no longer achieves the perfect balance of excavated soil and backfill (it generates excess materials) and has a slight impact on the sea, this option remains the most interesting - see table on next page, where the new option C is in red.

Ultimately, an optimized version of Option C, with slight marine work and with a bare access road (and no Taxiway D), was selected for the Preliminary Design on which this study of environmental impacts and measures is based. As explained in the impacts assessment methodology, despite optimizing the Preliminary Design to avoid impacts to the karst system and caves, an impact on the open-air caves is considered in case the detailed design shows that such an impact is not avoidable.

Option \ Criteria	Cut and fill + if equilibrium - - if import of fill - x if excedent of cut	Impact on Sainte Marie Hill + if saved - - if razed	Impact on the sea + if not impacted - - if channel blocked or significantly impacted x if low impacted	Impact on the existing infrastructures + if reused - - if impacted x if not impacted	Impact on airport operation during works + if operation not impacted - - if operation disturbed	Scoring and Ranking
A	-	+	-	-	-	1+ / 4- / 0x => -3 5th
B	-	-	x	-	+	1+ / 3- / 1x => -2 4th
Optimized C / option 3	x	-	x	+	+	2+ / 1- / 2x => +1 1st
D	-	+	-	x	+	2+ / 2- / 1x => 0 2nd ex aequo
F	-	+	-	x	+	2+ / 2- / 1x => 0 2nd ex aequo
G	-	+	-	-	+	2+ / 3- / 0x => -1 3rd

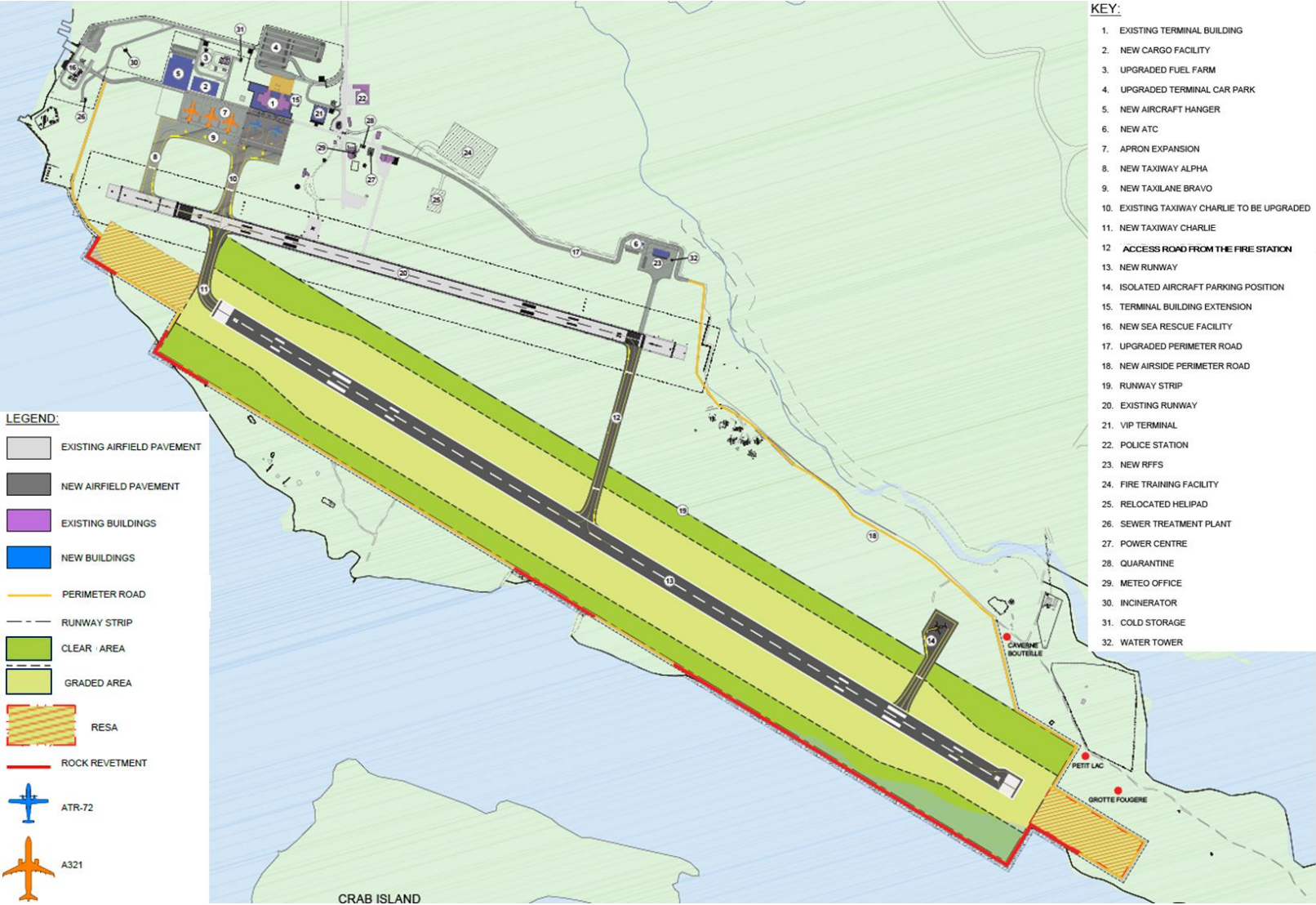


Figure 187: Preliminary Design Project

9 Preliminary Environmental and Social Management Plan (ESMP) for the construction phase

9.1 Preliminary Environment Management Plan for the construction phase

The following chapters (9.1.1, 9.1.2, 9.1.4) aim to summarize and guide to implement all the environmental measures associated to the construction phase. Some measures don't directly address the works nor the operation phase but must be implemented as soon as possible, upstream of the works: these are the compensation measures and the more global measures accompanying the project, and they are also covered in this part.

The measures' descriptions should be read in section 7 as this chapter doesn't provide an exhaustive description of all measures.

The first paragraph is a table listing all the commitment and measures and indicating for each one:

- when and by whom it should be initiated and carried out,
- how it should be monitored,
- and which are the indicators of success, as well as the corrective measures to be taken if the performance objectives are not met.

The second paragraph is intended to guide stakeholders in the implementation of these measures monitoring, indicating which operational plans and procedures should be established to implement and monitor the measures, and the guidelines for the preparation of these plans.

The first paragraph refers to the plan that ensures each measure implementation. The second paragraph recalls for each plan which measures it addresses.

As part of the final EISA, an Environmental and Social Management Plan will be developed in accordance with the World Bank ESS1. An ESMP is an instrument that details (a) the measures to be taken during the implementation and operation of a project (in this case closure) to eliminate or offset adverse environmental and social impacts, or to reduce them to acceptable levels; and (b) the actions needed to implement these measures. The ESMP will include requirements for mitigation, monitoring, capacity development and training, implementation schedule and cost estimates, as well as integration with the Project.

The mitigation measures provided in the draft ESIA Report are by no means exhaustive, as detailed design and additional specialist studies including technical investigations still need to be completed to provide a sufficiently comprehensive list of mitigation measures.

Nonetheless, the mitigation measures included in this report aim to address some of the salient impacts that may be caused by the Project, albeit on a high level at this stage.

9.1.1 Environmental Management Plan for the construction phase

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
Works facilities, buidings and plants	Wor-Fac	Works installations management plan	Plan describing each of the main works facilities and installations, and giving their emission limits, recommendation for installation on site and environmental measures	Works phase and prior to the works Site and works facilities management and monitoring plan	Control of the works environment chart and plans Site visits	Compliance of the installation to the recommendations	Replacement of installations which wouldn't comply	To be implemented by the Contractor Under ARL's control
	Phy-Mar-Mit-1	Control of backfilling processes	The construction processes must ensure a minimal volume of water in the low-lying embankment delimited area to insure the stability and sustainability of the runway.	Works phase and prior to the works Marine environment monitoring plan	Monitoring of turbidity level in the vicinity of the runway. Monitoring the water concentration in the embankment. Ensuring construction equipment are appropriate.	Compliance to water quality prevailing threshold.	Failure to meet the performance criteria shall be recorded as a non-conformance incident. In the case of structural failure or non-compliance turbidity level, works are to immediately cease. Incident has to be reported. Implementing protocol for depollution in case of spill.	External consultancy engineering Under ARL's control
Marine environment	Phy-Mar-Mit-2	Optimisation of the location of discharges	The discharge should be located in order to promote a local settling of the inorganic matter. A hydrodynamic survey can be conducted to identify these optimal locations.	Works phase and prior to the works Marine environment monitoring plan	The discharge should be located in order to promote a local settling of the inorganic matter. A hydrodynamic survey can be conducted to identify these optimal locations.	Compliance for water quality prevailing threshold	Monitoring of turbidity levels.	External consultancy engineering Under ARL's control
	Phy-Mar-Av-3	Optimisation of the discharges timetable to avoid times when currents reverse and/or already turbid condition	In order to minimize the intensity and extent of the flume, discharge should occur with weak current and low level of turbidity.	Works phase and prior to the works Marine environment monitoring plan	Monitoring of turbidity levels in the vicinity of the runway. Monitoring of magnitude and direction of the current in the vicinity of the runway.	Compliance to water quality prevailing threshold. Compliance with current prevailing threshold.	Discharge to be stopped if non-compliance. Reducing the hydraulic flows of the deposited materials.	External consultancy engineering Under ARL's control
	Phy-Mar-Mit-4	Silt curtain around discharges	Silt curtains can be used to contain suspended sediments and to prevent sediment dispersal.	Works phase and prior to the works Marine environment monitoring plan	Monitoring of turbidity levels. Conducting daily visual inspection of the curtain.	Compliance to water quality prevailing threshold.	Failure to meet the performance criteria shall be recorded as a non-conformance incident. Discharge to be stopped if non-compliance. Verifying the operation of the equipment according to the manufacturer's specifications	Contractor Under ARL's control

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
	Phy-Mar-Mit-5	Silt curtain around dredging area	Silt curtain controls the suspended solids generated by the dredging and is placed around the excavation site.	Works phase and prior to the works Marine environment monitoring plan	Monitoring of turbidity levels. Monitoring of contaminants in the water column.	Compliance to water quality prevailing threshold.	Dredging to be stopped if non-compliance. Verifying the operation of the equipment according to the manufacturer's specifications.	Contractor Under ARL's control
Hydrology - Stormwater management Waste water management / Water resource and water supply	Phy-Hyd-Mit-1	Temporary sedimentation ponds	Stormwater management from the modified natural watersheds: During the construction works, excavation of the terrain will facilitate transfer of sediments to the lagoon. => Implementation of specific temporary drains and buffer storage/sedimentation ponds	Works phase Surface stormwater run-off, drinking and wastewater management and monitoring plan	Monitoring of water quality at discharge; visual control.	Compliance with prevailing / target standards. Submission to local authorities once a month.	Discharge to be stopped if non-compliance. Informing of local authorities/client for remedial measures.	To be implemented by the Contractor Under RRA and ARL's control
	Phy-Wat-Mit-1	Install a desalination plant to supply drinking water to the workers' camp	Water supply for workers' site facilities and construction facilities: The construction works cannot create a burden on the existing water supply already suffering a severe deficiency Specific desalination skid for the water supply of the workers' site facilities and construction facilities	Works phase Surface stormwater run-off, drinking and wastewater management and monitoring plan	Monitoring of water quality at inlet and outlet of Treatment Plant; monitoring of water quality on distribution line; regular manual sampling/analysis (once a week) and visual control; automatic real time monitoring of main parameters (at least pH, turbidity and residual free chlorine) on distribution line.	Compliance with prevailing / target standards. Submission to local authorities once a month.	Water production to be stopped if non-compliance. Informing of local authorities/client for remedial measures.	To be implemented by the Contractor Under RRA and ARL's control
	Phy-Wat-Comp-2	Temporary or permanent relocation of the captation of actual Caverne Bouteille	Propose a new location for Caverne Bouteille, including a seawater pumping, settle a new pumping system and upgrade the existing treatment plant to provide water to the people currently supplied by Caverne Bouteille plant	Works phase and prior to the works Surface stormwater run-off, drinking and wastewater management and monitoring plan	Monitoring of water quality at inlet and outlet of Treatment Plant; monitoring of water quality on distribution line; regular manual sampling/analysis (once a week) and visual control; automatic real time monitoring of main parameters (at least pH, turbidity, salinity, temperature, TDS, electrical conductivity and residual free chlorine) on distribution line.	Compliance with prevailing / target standards. Submission to local authorities once a month. Significant change in the value of the measured parameters (e. g. +/- 20%) depending on the tolerance of the treatment system.	Water production to be stopped if non-compliance. Informing of local authorities/client for remedial measures. Temporary stop of pumping Identification of the source/cause of the water quality change Relocation of the catchment	To be implemented by the Contractor Under RRA and ARL's control
	Phy-Wat-Av-3	Works wastewater treatment plant	Wastewater management for the existing airport facilities and workers' site facilities: During the construction works, the existing wastewater treatment facilities will be dismantled. The sewage from the airport facilities will need to be treated to avoid direct	Works phase Surface stormwater run-off, drinking and wastewater management and monitoring plan	Monitoring of water quality at inlet and outlet of Treatment Plant; monitoring of water quality at discharge; regular manual sampling/analysis (once a week) and visual control; automatic real time	Compliance with prevailing / target standards. Submission to local authorities once a month.	Discharge to be stopped if non-compliance. Informing of local authorities/client for remedial measures.	To be implemented by the Contractor Under RRA and ARL's control

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
			discharge into the environment => Wastewater treatment skid of adequate capacity for both the airport facilities and for the workers' site facilities		monitoring on main parameters usually monitored.			
	Phy-Wat-Av/Mit-4	Preventive measures to reduce risks during the construction phase - Risk management plan	Oil and other spills related to chemical products used during construction =>Implementation of specific retention / confining zones for storage and use Identification of threat activity that will cease to be or not become a significant threat to drinking water	Works phase Site and works facilities management and monitoring plan	Monitoring of any leakage from the specific retention zones Ensure that all site managers are aware of the RMP and are able to apply it Verify that the resources to apply the RMP are present on the site	Zero leakage observed Regular meetings between the project manager, the contracting authority and all site managers	Implementation of remedial confining procedure Training workshops for all site managers	To be implemented by the Contractor Under ARL's control
Karst	Phy-Kar-Mit-1	Reduce speed of trucks' movement to an acceptable level	-	Works phase Site and works facilities management and monitoring plan	Speed limit ≤ 30 km/h	Speed controls	Warning violators	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Mit-2	Reduce rotations between embankment site and material storage site Carry out and document baseline observations at potentially exposed buildings to check on the presence of cracks ahead of works	-	Works phase Site and works facilities management and monitoring plan	Mass haul diagram	Check of plant's yield	Earth-moving plan adaptation	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Mit-3	Reuse of materials from cutting to embankment areas	-	Works phase Site and works facilities management and monitoring plan	Mass haul diagram	Check of reuse-ratio	Soil aeration/soil stabilization	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Mit-4	Reuse of topsoil materials after works phase	-	Works phase Site and works facilities management and monitoring plan	Mass haul diagram	Check of topsoil balance	Reuse exceeding quantities for landscaping	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Mit-5	Infilling of local erosion features and use of drainage system to manage rainwater responsible for local erosion	-	Works phase Karst monitoring plan	Daily site visits	No gullies development	Drainage system improvement	To be implemented by the Contractor Under RRA and ARL's control
	Phy-Kar-Mit-6	Open blasting and site excavation works to be done during dry season	-	Works phase Site and works facilities management and monitoring plan	Work schedule	Shift of planned tasks	Additional equipment implementation	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Mit-7	Reduce unit explosive charge decreasing noise impact	-	Works phase Karst monitoring plan	Vibration monitor device by geophones	Meet the targeted particle velocity	Corrective action plan implementation	To be implemented by the Contractor Under RRA and ARL's control

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
	Phy-Kar-Mit-8	Concentrate open blasting operations in a short amount of time	-	Works phase Site and works facilities management and monitoring plan	Work schedule	Schift of planned tasks	Additional equipments implementation	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Mit-9	Work only during the day and inform local authorities and communities about the health and safety plan applicable on work site	-	Works phase Air quality and noise environment management and monitoring plan	Work schedule	Construction supervisor check	Stop works at the scheduled time	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Mit-10	Avoid running excavator's engines in case of no use	-	Works phase Site and works facilities management and monitoring plan	Planning of equipment use	Construction supervisor check	Stop of not planned machines	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Mit-11	Chose the closest extraction site for fill material / Forbid the export of cuttings	-	Prior to the works Site and works facilities management and monitoring plan	Trucks and boat traffic / Noise and air pollution monitoring	Distance of the extraction site / No export traffic	Change site extraction / Explore on site storage solutions for cuttings	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Mit/Av-12	Define a restricted area around the caverns with no allowed access to heavy vehicles	-	Works phase Site and works facilities management and monitoring plan	Enclosure tape around the restricted area	Construction supervisor check	Warning violators	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Mit-13	Reduce trucks' movement's speed to an acceptable level to minimize the induced vibrations	-	Works phase Site and works facilities management and monitoring plan	Speed limit ≤ 30 km/h Checking visit inside the caves / Caves monitoring Plan	Speed controls	Warning violators	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Av-14	Adapt and reduce trucks' movements and rotations between embankment filling site and material storage site	-	Works phase Site and works facilities management and monitoring plan	Mass haul diagram	Check of plant's yield	Excavation rate adaptation	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Av-15	Restrict traffic in close vicinity of the caves	Retention measure for unauthorized access	Works phase Site and works facilities management and monitoring plan	Daily inspection of the condition of the barriers	Damage to facilities	Additional mobile fences where needed Replacement of damaged parts	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Av-16	Installation of a protective formwork to ensure protection and controlled access by airport authorities	-	Works phase Site and works facilities management and monitoring plan	Security checkpoint	Airport security rules	Airport security corrective actions	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Comp-17	Remove the remaining fossiliferous sediments from all threatened caves	Safe storage of sedimentary materials containing palaeontological and paleoenvironmental information	Prior to the works Karst monitoring plan	Preventive paleontological searches Supervision of excavation by experts and scientists	Preventive research regulation Complete and detailed list of materials removed and compliance of storage sites	Implementation of the planned correctives actions Final inspection and relocation of undisplaced materials	To be implemented by an external specialist Under ARL's control
Phy-Kar-Av/Mit-18	Daily maintenance and inspection of excavators	Liquid leakage prevention measure (oil and fuel)	Works phase Karst monitoring plan	Inspection of logbooks of the maintenance of equipment	Missing information in the logbook Number and intensity of accidental spills of hydrocarbons and other chemicals	In case of a surface spill, the environmental response plan must be implemented immediately.	To be implemented by the Contractor Under RRA and ARL's control	

Theme / Issue	Title and ID of the measure	Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
	Phy-Kar-Av/Mit-19	No maintenance and refuelling on the construction site (or with specific waterproof delimited zone)	Vehicles must be refuelled on a dedicated site	Works phase Site and works facilities management and monitoring plan			To be implemented by the Contractor Under ARL's control
	Phy-Kar-Mit-20	Establishment of a storage site for earthworks wastes (wood from formwork, material and equipment wrappings, unusable cement / grouting mixes, damaged or contaminated construction material), close to the project site, in order to reduce pollution induced by traffic from storage activity	-	Works phase Site and works facilities management and monitoring plan	Installation of a network of observation wells upstream and downstream of the facilities to allow, on the one hand, sampling and analysis of groundwater to define reference values and, on the other hand, to establish a groundwater quality monitoring program (and levels) during the project development phases (construction and operation phases)	Number and intensity of accidental spills of hydrocarbons and other chemicals In the event of a surface spill, the environmental response plan must be implemented immediately. In the event that there is a significant change in groundwater quality and/or a contaminant is detected, the environmental management plan will also have to be put in place to contain the contamination.	To be implemented by the Contractor Under ARL's control
	Phy-Kar-Av-21	Proceed to an impact assessment of the extraction site and have the material origin validate priori the works phase	-	Prior to the works phase Site and works facilities management and monitoring plan	-	-	-
Biodiversity	BioT-Av-1	Avoid remarkable trees located at the edge of the project Targeted species: <i>Antirhea bifurcata</i> , <i>Elaeodendron orientale</i> , <i>Fernelia buxifolia</i> , <i>Hyophorbe verschaffeltii</i> , <i>Terminalia bentzoe subsp. rodriguesensis</i>	This measure consists in avoiding the destruction of remarkable trees located at the boundaries of the project footprint by locally adapting the project boundaries. A total of 19 trees could be easily avoided.	Works phase Before the work begins. Biodiversity management and monitoring plan	These 19 trees must be marked prior to the works phase with permanent devices (fences, ribbons, paintings..) and tagged with an identification number (ID) in order to be properly followed during the works phase	Number of trees left after the works phase (out of the 19)	Reinforcing measure BioT-Mit-3 External biodiversity specialists / RRA services Under RRA and ARL's control Potential partners : Wildlife Fondation, Forestry Services
	BioT-Av-2	Moving the control tower out of the nature reserve	This measure consists in avoiding the destruction of approximately 1 hectare of the buffer area of the Anse Quitor nature reserve. This measure allows to save 6 specimens of the following species: <i>Elaeodendron orientale</i> , <i>Sarcanthemum coronopus</i> , <i>Terminalia bentzoe subsp. rodriguesensis</i>	This measure must be anticipated in the project design Biodiversity management and monitoring plan	The official boundaries of the nature reserve will be provided by the forestry services	- Surface area left inside the Anse Quitor nature reserve (objective: 0) - Project design with a repositioning of the control tower	Reinforcing measure BioT-Comp-7 External biodiversity specialists / RRA services Under RRA and ARL's control Potential partners : Wildlife Fondation, Forestry Services for the official limits of the nature reserve
	BioT-Mit-3	Creating an arboretum of endemic species inside the airport landscaping	This measure consists in planting 80 specimens of rare and endangered endemic species within the airport limits after the extension airstrip project. This aims to protect, preserve and create an arboretum of endemic seeds	Works phase This measure must be implemented way before the works phase, in particular as regards with the collection of plant material from	A partnership with the Forestry Services or the Mauritius Wildlife Foundation will be conducted in order to produce seedlings of native species from seeds, cuttings or	- number of plants produced (objective : 100) - number of species planted	Reinforcing measure BioT-Comp-7 External biodiversity specialists / Contractor Under ARL's control Potential partners :

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
			that will be used afterwards to produce endemic plants for nature reserves in Rodrigues.	specimens outside the project area. Biodiversity management and monitoring plan	juveniles collected from the nature reserves of Rodrigues and/or Mauritius. Collection of plant material will be authorized in advance by the reserve managers in any case. A specific protocol will be designed for tree transplantation.			Wildlife Fondation, Forestry Services
	BioT-Mit-4	Transplant remarkable trees and ferns intended to be cut down during the works phase	This measure consists in transplanting all or part of the remarkable trees and ferns intended to be destroyed by the project: in priority, Diospyros, Terminalia, Foetidia, Antirhea, Nephrolepis	Works phase Before and or during works phase (machines will be available during the works phase which optimizes costs) Biodiversity management and monitoring plan	A competent and trained external coordinator on the transplantation protocol will be mobilized	- number of trees transplanted - number of trees transplanted which survive the 1st, 2nd, 3rd, 4th and 5th year after transplantation	Reinforcing measures BioT-Mit-3, BioT-Mit-5, BioT-Comp-6	External biodiversity specialists / RRA services Under RRA and ARL's control Potential partners : Wildlife Fondation, Forestry Services
	BioT-Mit-5	Genetic conservation of populations of impacted rare species : production and reintroduction of clones and genetic ancestors of these species	In response to the destruction of several rare species specimens, this measure consists in ensuring the production and reintroduction of clones and genetic ancestors of these species in order to preserve their genetic lineage in the long term. A total of 14 to 35 specimens will be produced, depending on the results obtained by vegetative and sexual propagation.	This measure must be implemented way before the works phase, in particular as regards with the collection of plant material from specimens intended for destruction inside the project footprint. Several campaigns have to be scheduled in order to target the right periods of fruiting Biodiversity management and monitoring plan	A partnership with the Forestry Services or the Mauritius Wildlife Foundation will be conducted in order to produce seedlings of native species from seeds, cuttings or juveniles collected from the specimens located within the project footprint.	- number of plants produced (objective : 35) - number of species planted	Reinforcing measures BioT-Mit-3, BioT-Mit-4	External biodiversity specialists / RRA services Under RRA and ARL's control Potential partners : Wildlife Fondation, Forestry Services
	BioT-Comp-6	Action plan towards more sustainable agricultural practices for native biodiversity	This measure consists in initiating a new approach for the management of extensive agriculture on the island of Rodrigues by proposing a turnkey operational action plan.	Planning over 24 months will allow satisfactory consultation times for the implementation of the action plan in the short term Biodiversity management and monitoring plan	This action plan can be approached by: 1- the inventory and consultation of all agricultural and ecologist partners throughout the project; 2- the establishment of the development challenges of livestock breeding in Rodrigues; 3- drawing up an inventory of actions that can improve the quality and productivity of livestock farming by promoting local biodiversity;	- Obtaining an action plan validated by the regional assembly in 2022	Reinforcing measure BioT-Comp-7	External biodiversity specialists / RRA services Under RRA and ARL's control Potential partners: Wildlife Fondation, Agricultural and Forestry Services, Regional Assemblée...

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
					4- proposing a fine cartographic work accompanied by spatialized actions throughout the territory of Rodrigues.			
	BioT-Comp-7	Ecological restauration within the limits of the Anse Quitor nature reserve	This measure consists in: <ul style="list-style-type: none"> • Rebuilding the fence around the Anse Quitor nature reserve, with one that would be similar to the fence around the airport in order to discourage grazing livestock inside the reserve. This measure is a short-term response to the grazing vs. biodiversity issue that has to be solved with the offset measure (BioT-Comp-6: Action plan towards more sustainable agricultural practices for native biodiversity). • Reinforcing native species populations by planting 500 native plant specimens within the Anse Quitor nature reserve buffer area, located besides the future airport boundaries (see map below). 	Harvesting (seeds, cuttings) and production must take place well before the works phase as well as the fencing work Biodiversity management and monitoring plan	<ul style="list-style-type: none"> - Check the watering quality of the plants; - Identify, locate and count exotic species and define appropriate control methods against invasive and potentially invasive exotic species; - Quantify the mortality rate and health status of native species. - Establish corrective measures if necessary, in order to always orientate this rehabilitation project in an ecologically correct direction. 	<ul style="list-style-type: none"> - Number of plants planted - Mortality rate (total/species) - Number of placettes - Number of linear metres of fence 	Reinforcing measures BioT-Mit-3, BioT-Mit-4	External biodiversity specialists / RRA services Under RRA and ARL's control Potential partners: Wildlife Fondation, Forestry Services
	BioT-Mit-8	Collect arthropods from the Tropiphodora genus before and during earthwork	This measure consists in collecting living individuals of Tropiphodora within the project footprint boundaries. Several campaigns will be conducted before the works phase and during earthwork. Sampling planning will allow the entire project area to be visited in an equivalent manner. If species are more abundant in some areas, these areas will be collected more thoroughly.	Works phase This measure must be implemented before and during the earthwork phase. Several campaigns have to be scheduled. Biodiversity management and monitoring plan	Learn how to distinguish the two different species recorded on site	<ul style="list-style-type: none"> - number of living specimens collected - number of species collected - number of survey campaigns 	None	External biodiversity specialists / Contractor Under ARL's control Potential partners: Vincent Florens (Department of Biosciences, University of Mauritius, Réduit, Mauritius)
BioM-Mit-1	Installation of a floating boom to confine sediments and prevent their resuspension in the marine environment	To contain sediments and prevent their resuspension in the marine environment	Works phase During the construction works Marine environment monitoring plan	<ul style="list-style-type: none"> - Visual surveillance of the floating boom's good hold - Measurement campaign of turbidity and current 	<ul style="list-style-type: none"> - Ensure that the floating boom is properly - Visual monitoring of corals at Pointe Palmiste in relation to the turbid plume - Monitoring turbidity with: Duration over an alert and a stop threshold Number of exceedance over a threshold Maximum concentration tolerated 	<ul style="list-style-type: none"> - Decrease of the released flow - Temporary stop of the sediment discharge - Temporary stop of the dredging 	Contractor Under ARL's control Potential partner : Shoals Rodrigues / SEMPA	

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
	BioM-Mit-2	Monitoring for the possible presence of turtles in the project area and egg laying site on Crab Island	To preserve protected species and maintain local biodiversity	Works phase During the construction works Laying period Marine environment monitoring plan	Visual surveillance by boat, on foot Laying traces on beaches	GPS location, descriptive and photographic information Continuous consolidation of all published information	Stopping works if marine turtles are present and come to lay eggs on the beaches near the project	Shoals Rodrigues / SEMPA Under ARL's control
	BioM-Av-3	Avoid coral heads located at the edge of the project	To preserve protected species and maintain local biodiversity	Before the construction works Marine environment monitoring plan	Identify corals in the work area Marking with buoys Check their movements to SEMPA	Waypoint's position of each type of coral Conservation status (Before/after the movements)	None	Contractor Under ARL's control Potential partner : Shoals Rodrigues / SEMPA
Infrastructures and solid waste management	Inf-Mit-1	Transfer materials out of high traffic periods	To avoid creating traffic jams by adapting the works supply traffic schedules	Works phase Site and works facilities management and monitoring plan	Complaint collection	Zero additional traffic jam Zero unaddressed complaint	Re-adapting traffic schedules	To be implemented by the Contractor Under ARL's control Partner: RRA
	Inf-Mit-2	Anticipate and supervise exceptional convoys	To avoid creating traffic jams by adapting the exceptional convoys schedules and the communication before and during their passage	Works phase In case of exceptional convoys / before and during passage Site and works facilities management and monitoring plan	Complaint collection	Zero additional traffic jam Zero unaddressed complaint	Re-inforcing communication and exceptional convoys schedule adaptation	To be implemented by the Contractor Under ARL's control Partner: RRA
	Inf-Mit-3	Rehabilitate roads that were used during construction and at the end of works	Rehabilitate the roads that would be spoiled by the trucks traffic	Works phase Site and works facilities management and monitoring plan	Roads inspection	Zero road degradation during the works and at the end of the works	Re-inforcing roads inspection and rehabilitation	To be implemented by the Contractor Under ARL's control
	Inf-Mit-4	Adapt the period of work	To avoid traffic jam by adapting the works season, if possible (vacations, low touristic season)	Works phase / to be anticipated during the works' construction planning Site and works facilities management and monitoring plan	Complaint collection	Zero additional traffic jam Zero unaddressed complaint	Reinforce Inf-Mit-1	To be implemented by the Contractor Under ARL's control Partner: RRA
	Inf-Mit-5	Use generators	To avoid to create extra burden on the electricity network for works supply	Works phase Site and works facilities management and monitoring plan	Complaint collection	Zero deficiency in households' electricity supply	Replace more electricity for works supply with generators	To be implemented by the Contractor Under ARL's control Partner: RRA
	Inf-Mit-6	Recycling and reuse of materials	Sorting and recycling of works' solid waste	Works phase Site and works facilities management and monitoring plan	Solid Waste management Plan Environmental site visits and works environment supervision	Recycling objective to be proposed by the detailed design	Improve the sorting system and worker sensibilization	To be implemented by the Contractor Under ARL's control
Air quality	Air-Mit-1	Institute a speed limit on all unpaved roads around the site (max 30 km/h)	-	Works phase	Air quality management and monitoring plan	air emission standards	-	To be implemented by the Contractor

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
	Air-Mit-2	Regularly water the main roads and areas producing dust	-	Air quality and noise environment management and monitoring plan		air emission standards	-	Under ARL's control
	Air-Mit-3	Limit the storage and handling of materials that may create dust	-			air emission standards	-	
	Air-Mit-4	Reduce road traffic to a minimum by optimizing the truck loading for the site supply	-			air emission standards	-	
	Air-Mit-5	Minimize on-site travel distances and avoid as far as possible traffic close to inhabited areas	-			air emission standards	-	
Noise environment	Noi-Mit-1	Avoid night work and limit work during evening period	-	Works phase Air quality and noise environment management and monitoring plan	Noise environment management and monitoring plan	noise emission standards	-	To be implemented by the Contractor
	Noi-Mit-2	Choose the least noisy techniques and equipments	-			noise emission standards	-	Under ARL's control
Landscape	Land-Mit-1	Limit the vegetation clearing area during construction	-	Preliminary works (clearance and site installation): before site clearance starts and during working period. Preparation period of every subsidiary construction contract. Landscape management and monitoring plan	An expert such as an environmentalist or a landscape architect	Visual check-up Pictures in the monthly environmental report	Compensation planting and seeding, site cleaning	Contractor Under ARL's control
	Land-Mit-2	Prevent encroachment of areas outside designated boundaries	-	Any phase of work Landscape management and monitoring plan	An expert such as an environmentalist or a landscape architect	Visual check-up Pictures in the monthly environmental report	Compensation planting and seeding, site cleaning	Contractor Under ARL's control
	Land-Mit-3	Minimize the lighting of construction sites	-	Any phase of work Landscape management and monitoring plan	An expert such as an environmentalist or a landscape architect	Visual check-up Pictures in the monthly environmental report	Contractor to change the lighting furnitures and orientation on request	Contractor Under ARL's control
	Land-Mit-4	Minimize visual intrusion	-	Prior to construction works, not later than preparation period of main contractor Landscape management and monitoring plan	A landscape architect	Preliminary Visual Assessment control and final report	To be defined in the visual assesment report	Detail Design Engineer and Architects ARL Contractor Under ARL's control
	Land-Mit-5	Ensure that platforms and construction work areas are maintained in a clean and orderly manner	-	Any phase of work Landscape management and monitoring plan	An expert such as an environmentalist or a landscape architect	Visual check-up Pictures in the monthly environmental report	Contractor to proceed to cleaning and site management on request	Contractor Under ARL's control

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
	Land-Mit-6	Perform temporary seeding	-	Any phase of work Landscape management and monitoring plan	An expert such as an environmentalist or a landscape architect	Regular billing for seeding	Contractor to proceed to seeding on request	Detail Design Engineer and Architects ARL Contractor Under ARL's control
	Land-Mit-7	Temporary fences and earthworks will be arranged to reduce visual intrusion	-	Any phase of work Site and works facilities management and monitoring plan	An expert such as an environmentalist or a landscape architect	Visual check-up Pictures in the monthly environmental report	Contractor to adapt fence type and stock piles layout on request	To be implemented by the Contractor Under ARL's control
	Land-Mit-8	Ensure that earth and material storage areas are not located directly on the coast	-	Any phase of work Site and works facilities management and monitoring plan + Landscape management and monitoring plan	An expert such as an environmentalist or a landscape architect	Visual check-up Pictures in the monthly environmental report	Contractor to adapt storage and stock piles layout on request	To be implemented by the Contractor / Detail Design Engineer and Architects Contractor Under ARL's control
	Land-Mit-9	Plantings are designed and arranged to form visual screens to mitigate visual impacts	-	As early as possible Prior to construction works Landscape management and monitoring plan	A landscape architect	Detailed Impact Assessment on site and report	To be defined in the Detailed Design report	Detail Design Engineer and Architects ARL Contractor Under ARL's control
	Land-Mit-10	Rehabilitate areas that were temporarily used during construction.	-	During preparation period of every subsidiary construction contract Landscape management and monitoring plan	A landscape architect	Visual check-up Photo report Compare Site Pictures before / after	To be defined	Detail Design Engineer and Architects ARL Contractor Under ARL's control
	Land-Mit-11	Favor dispersed relocation building in existing communities	-	Prior to agreement with families Landscape management and monitoring plan	Relevant government administration	Construction control	None	RRA Under RRA and ARL's control
	Land-Mit-12	Relocate families outside of the Zone of Visual Influence	-	Prior to agreement with families Landscape management and monitoring plan	Relevant government administration	Construction control	None	RRA Under RRA and ARL's control
	Land-Mit-13	Community support in construction process	-	Landscape management and monitoring plan				RRA Under RRA and ARL's control
	Land-Mit-14	Establishment of an Airport Urban Development Master Plan to monitor and frame urban development	-	As early as possible Prior to construction works	Designer such as a landscape architect, urbanist or architect	Deliver an Urban Development Master Plan based on site study and three scenarios	None	RRA Under RRA and ARL's control

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
		related to airport activity and ensure sustainable good living conditions		Landscape management and monitoring plan				
	Land-Mit-15	Airport buildings and infrastructures to reach architectural quality and soundness	-	All Design Phases Architect selection Construction contract selection Contractor selection Any phase of work Landscape management and monitoring plan	Architect in chief to be nominated	Rodrigues tourism officials and representatives demands met on visual representation, exhaustiveness of Detailed Design	None	Detail Design Engineer and Architects ARL Under ARL's control
	Land-Mit-16	Touristic infrastructure to respect the scale of Rodrigues' landscape and sense of place	-	All Design Phases Architect selection Construction contract selection Contractor selection Any phase of work Landscape management and monitoring plan	Relevant government administration	Rodrigues tourism officials and representatives demands met on visual representation, exhaustiveness of Detailed Design	None	RRA Under RRA and ARL's control
	Land-Mit-17	Urban development to foster the development of public places and public amenities	-	All Design Phases Architect selection Construction contract selection Contractor selection Any phase of work Landscape management and monitoring plan	Relevant government administration	Rodrigues tourism officials and representatives demands met on this particular concern	None	RRA Under RRA and ARL's control
	Land-Mit-18	Establishment of local Urban Development Master Plan to monitor urban development related to tourism growth, to value and enhance the local landscape	-	As early as possible Prior to construction works Landscape management and monitoring plan	Designer such as a landscape architect, urbanist or architect	Deliver an Urban Development Master Plan based on site study and three scenarios	None	RRA Under RRA and ARL's control

Table 133: Overall Environmental Management Plan for the construction phase

9.1.2 Environment Management Plans to be implemented for the construction phase

9.1.2.1 Site and works facilities management and monitoring plan

9.1.2.1.1 Environmental provisions and procedures to be implemented for the site and works facilities

This plan should include all the provisions of the site to ensure that the following measures are implemented:

- “Wor-Fac”,
- all the measures for infrastructures and solid waste management: “Inf-Mit-1 to 6”,
- the measures targeting the earthworks methods and the works schedule and phasing (“Phy-Kar-Mit-3 / 4 / 6 / 8 / 10 / 11 / 14 / 20 / 21”, “Land-Mit-7 / 8”),
- the measures targeting the engine and people circulation rules inside the works site (“Phy-Kar-Mit-1 / 2 / 10 / 12 / 13 / 15 / 16”),
- the measures “Phy-Wat-Av/Mit-4” and “Phy-Kar-Mit-19”.

This plan should be implemented by the contractor and follow the following guidelines. It should include the following procedures:

- A waste management and monitoring plan,
- An excavated soil management and monitoring plan,
- A hazardous material management plan,
- A spill risk management plan (Phy-Wat-Av/Mit-4),
- A works traffic inside and outside the works site management plan,
- A fencing plan and procedure,
- A plants monitoring plan.

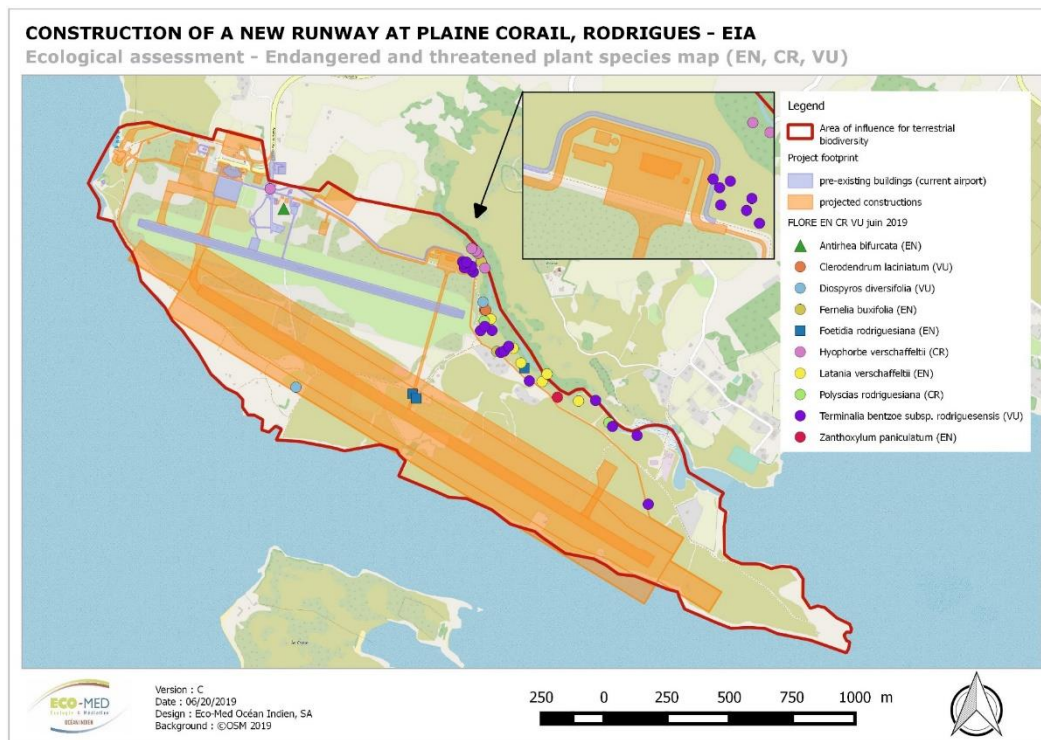
9.1.2.1.2 Plants and facilities

The main site facilities to be provided for the construction of the new runway and other airport project components are as follows:

- Base camp,
- Wastewater treatment plant,
- Desalination plant,
- Asphalt plant,
- Concrete plant,
- Storage and maintenance sheds and hangars,
- Crane,
- Incinerator.

9.1.2.1.2.1 Location

These facilities should not be located at the level of protected species designated as to be avoided by the project.



9.1.2.1.2.2 Limit emissions

The following standards, promulgated under the Environment Protection Act, apply to all of the site facilities.

First Schedule (regulation 3)

Emission Standards

The following standards are maximum limits for the corresponding pollutant.

Pollutant	Applicable to	Standard	Applies to project (construction / operational phase)
(i) Smoke	All stationary fuel burning source	Ringelmann No. 2 or equivalent opacity (not to exceed more that 5 minutes in any period of one hour)	X
(ii) Solid particles	(a) Any trade, industry, process, industrial plant or fuel-burning equipment	200 mg/m ³	X
	(b) Any existing trade, industry process or industrial plant using bagasse as fuel	400 mg/m ³	
(iii) Sulphuric acid mist or sulphur trioxide	(a) Any trade, industry or process (other than combustion processes and plants for the manufacture of sulphuric acid)	120 mg/m ³ as sulphur trioxide	X
	(b) Any trade, industry or process in which sulphuric acid is manufactured	30 000 mg/m ³ as sulphur trioxide	
(iv) Fluorine compounds	Any trade, industry or process in the operation of which fluorine, hydrofluoric acid or any inorganic fluorine compounds are emitted	100 mg/m ³ as hydrofluoric acid	X
(v) Hydrogen Chloride	Any trade, industry or process	200 mg/m ³ as hydrogen chloride	X
(vi) Chlorine	Any trade, industry or process	100 mg/m ³ as chlorine	X
(vii) Hydrogen sulphide	Any trade, industry or process	5 ppm as hydrogen sulphide gas	X
(viii) Nitric acid or oxides of nitrogen	Any trade, industry or process in which the manufacture of nitric acid is carried out	2 000 mg/m ³ as nitrogen dioxide	
(ix) Nitric acid or oxides of nitrogen	Any trade, industry or process other than nitric acid plant	1 000 mg/m ³ as nitrogen dioxide	X
(x) Carbon monoxide	Any trade, industry or process	1 000 mg/m ³ as carbon monoxide	X

9.1.2.1.2.3 Focus and the base camp and access roads

The base camp will be designed to accommodate expatriated engineers and workers. It is planned to welcome about 400 people on site.

The following provisions have to be implemented in the Site and works facilities management and monitoring plan:

- Provision of all the basic services necessary for the base camp proper functioning and maintenance: sanitary facilities, refectory, accommodation, electricity supply, etc;
- Verification of compliance with standards and regulations regarding health, safety and accommodation conditions in the operation of the base camp;
- Organisation of a waste management system for the base camp including waste sorting;
- Clear and signposted demarcation of the life base;
- Regulation of traffic in the life base and on the access roads: planning of access schedules and exceptional convoys;
- Planning of a dismantling plan for the base and a rehabilitation of the access roads.

9.1.2.1.2.4 Hangars and sheds

All material storage and maintenance activities must be carried out under the shelter of hangars sized to withstand the particular local climatic conditions.

Hangars and sheds must all have their own pollution containment systems. Maintenance and refuelling hangars must be equipped with their own hydrocarbon separator.

9.1.2.1.2.5 Asphalt and concrete plants

- Concrete and asphalt plants must be equipped with filter systems.
- Their wastewater must be treated separately from the site wastewater.

9.1.2.1.3 Facilities monitoring

The condition of all site facilities must be weekly checked by a general inspection. The same applies to compliance with all environmental management rules and procedures put in place to respond to measures concerning site installations.

9.1.2.1.4 Person in charge

This plan should be prepared, managed and implemented by the contractor, under ARL's and RRA's relevant commissioners' control.

9.1.2.2 Surface stormwater run-off, drinking and wastewater management and monitoring plan

9.1.2.2.1 Environmental provisions to be implemented

This plan should include all the provisions of the site to ensure that the measures regarding stormwater, wastewater and drinking water resources are implemented : « Phy-Wat-Mit-1 », « Phy-Wat-Comp-2 », « Phy-Wat-Av-3 » et « Phy-Hyd-Mit-1 ».

Refer to section 7 where the detailed measures are described.

A water management plan should be provided by the contractor describing the works facilities envisaged to implement these measures.

The following sections guide the monitoring system to be set up.

9.1.2.2.2 Facilities monitoring and survey

The measures implemented during the works phase will require a monitoring plan of:

- the water quality at the inlet and the outlet of the Water Treatment Plants (both for Drinking Water via the Reverse Osmosis installations and the Sewage Treatment Plant);
- of the stormwater quality at the discharge points at sea.

Therefore, a regular manual sampling/analysis (tentatively once a week) and visual controls of the different works implemented (buffer storage and associated equipment: valves and automatic real time monitoring instrumentation on main parameters usually monitored) will be necessary.

Regarding the water quality, the analysis results shall be compliant with the standards promulgated under the Environment Protection Act, and will be submitted to local authorities once a month. In case of non-compliance, for each installation, the outlet should be stopped and information conveyed to relevant local authorities/client for remedial measures. The remedial measures include direct pumping of non-compliant water/effluents for proper evacuation and elimination.

However, regarding the treatment works, adequate Operation & Maintenance tasks, under the supervision of the Client, should enable to avoid the risks mentioned above. These include the following specific tasks for operation and maintenance of the treatment plant:

- Water analyses = 4h per week
- Electromechanical tasks = 4h per week per Treatment Plant + 2h per month per pumping station
- Current O&M tasks = 10h per week per treatment Plant + 2h per week per pumping station
- Oversight 24h/24h = intervention whenever required (alarm, breakdown), with remote information available, considering the implementation of a minimum remote operation monitoring equipment.

Regarding the buffer storage works and oil separators for stormwater run-off, following regular visual controls, maintenance tasks shall be required and carried out, including mainly pumping of sedimentation materials and floats (oil spills), or replacement of monitoring instrumentation if deemed necessary.

9.1.2.2.3 Person in charge

This plan should be prepared, managed and implemented by the contractor, under ARL's and RRA's relevant commissioners' control.

The basic monitoring tasks should be carried out by a qualified technical worker.

The specific operation and maintenance tasks for the treatment plants should be carried out by 2 skilled technicians + 1 on stand-by whenever required. The skills required include:

- A technician with good qualifications in water analysis.
- A technician with good qualifications in electromechanics.
- All O&M personnel shall have good Computer skills.

9.1.2.3 Karst monitoring plan

9.1.2.3.1 Environmental provisions to be implemented

This plan refers to measures “Phy-Kar-Mit-5 / 7 / 18” and aims to guide the development of a robust and comprehensive karst monitoring system from both a hydrogeological and geotechnical perspective.

“Phy-Kar-Mit-17” which concerns the sediments displacement must be implemented under ARL’s control by a specialist prior to the works. ARL should draw up and implement a plan to follow the sediments moving and storage.

9.1.2.3.2 Groundwater quality monitoring plan

This plan consists to identify changes in groundwater quality and flow regime during working and operation phases.

This plan must be implemented:

- Before the working phase to define reference values of water quality and groundwater levels;
- During the working and operation phases to identify any changes of indicators.

This plan consists in:

- Installation of a network of observation wells:
 - o Upstream (minimum of 3 observation wells; depth up to 5 meters below groundwater level).
 - o Downstream – between facilities and shoreline - (minimum 5 observation wells; depth up to 2 meters below groundwater level). Multi-piezometers must be considered to be installed in each downstream borehole: The deeper must be installed below zero mean sea level and the other between the groundwater level and the zero level.
- Implementation of monitoring program:
 - o Groundwater level measurement;
 - o Groundwater sampling and in-situ parameters analysis;
 - o Sampling frequencies: A first sampling campaign must be carried out in all observation wells before work begins. Downstream well sampling should be conducted on a monthly basis during the construction phase and semi-annually during operations;
 - o Parameters analysis of groundwater: The first samples will be fully analysed according to current national water quality standards (number of parameters and threshold values). At a minimum, the Dissolved Priority Pollutant Metals (see note) should be analysed as well as petroleum hydrocarbons.

Note: According to US EPA the 13 Dissolved Priority Pollutant Metals are : Arsenic, barium, cadmium, chromium, Lead, mercury, selenium, Silver, copper, Iron, manganese, Zinc and Sodium.

The groundwater quality monitoring program will be adjusted based on the results of the first analyses.

The performance indicators are the following:

- Groundwater level: Drastic change of initial groundwater levels.
- Groundwater quality:
 - o Detection of hydrocarbons in a sample
 - o Dissolved Priority Pollutant Metals: Change of more than 20% of threshold values
- Abnormal odor of kerosene, diesel, gasoline or other products used on the site.

In case of insufficient performance, the corrective measures are the following:

- Identification of the source of contamination;
- Stop the source of contamination if it is properly identified;
- In the case of an oil spill: activate the oil spill contingency plan.
- Implementation of depollution protocol and set up a contaminant recovery system depending on the nature of the contaminant.

9.1.2.3.3 Caves Monitoring Plan

This plan aims to carry out a complete survey prior to the works and then monitor the earthworks, construction and airport operation impact on the caves.

ARL should be responsible of this plan as it should be carried out in a coherent way before, during and after the works. A cave expert should be mandated to carry out these surveys, and could teach and coordinate the contractor and airport environment specialists in charge of the local monitoring.

The initial survey should include the description of the followings:

- Internal factors:
 - o Geological characteristics
 - o Fracturation
- External factors:
 - o Presence of water flow through the cave
 - o Surface vegetation upon the caves (and roots impact on the cave opening)
 - o Temperature, airborne moisture and airflow inside the cave
 - o Pollution traces

During the works, the following monitoring should be carried out:

- Internal factors:

- Geological characteristics: monitoring of sedimentation compaction inside caves by visual inspection and analysis (description, thickness, sampling and analysis);
- Fracturation: before and after the blasts, monitoring of strata behaviour (number of fracture traces) as well as count inventory of collapsed blocks located at the ground surface of the cave will be carried out. This will be observed by visual inspection (mapping of fractures network, measurement of fractures orientation);
- External factors :
 - Vibrations: monitoring of vibrations with seismographs located inside the caves (at ground surface and on walls of caves). (3 seismometers per main cave).
 - **Note:** In parallel and above works phase, vibration consultant to provide a blasting plan comprising hole size, depth, spacing, burden, type of explosives, type of delay sequence, maximum amount of explosive on any one delay period, depth of rock, and depth of overburden if any. The vibration consultant will not be allowed to increase the maximum explosive charge weights per delay included in the plan without the approval of the contractor and airport environment specialists. Record of each blast (date, time and location, amount of explosives used, maximum explosive charge weight per delay period) will be kept by ARL over the whole work period to be consulted by specialists.
 - Water flow: permanent groundwater monitoring (see groundwater monitoring plan);
 - Temperature, airborne moisture and airflow: general characterization of lint removal activities, analysis of dust/lint accumulation plates, analysis of airborne dust/lint. This survey needs sampling and analysis;
 - Pollution traces: visual monitoring of man-induced pollution (oils, wastes, mapping/inventory of visitor impacts, monitoring of cave chemistry) observed by visual inspection and analysis (description, sampling and analysis).

This monitoring should be carried out:

- Once after the first explosive tie and then twice a week during the open blasting works,
- Every two weeks the, during the whole works phase.

This frequency should be increased for the main caves monitoring (Petit Lac and Grotte Fougere, and Caverne Bouteille), up to every day. In the less important caves, a simple visit on visual criterias should be done every month.

At this stage, signs which should lead to stop the works and find other construction methods or additional protections will be assessed by determining acceptable levels of impact on caves in consultation with specialists of cave on different topics, such as:

- Fracturation: permissible increasing percentage of fractures (length and spacing), in cm, to be determined from ground observations;
- Vibrations: permissible Peak Particle Velocity (PPV) in mm/s, to be determined based of ground vibration natural frequency ranges of caves. The exceeding the threshold will lead stopping the works;
- Water flow: retained maximum groundwater level (in case of wet caves), to be determined based on groundwater monitoring over a minimum 6 months records period (12 months recommended);
- Temperature, airborne moisture and airflow: retained maximum degrees and percentages of moisture of the air inside the caves.

Note that all retained impact levels should be applied thanks to cave preservation strategy, depending on the key aspect to be preserved (karstic heritage, drinking water source or no interest).

9.1.2.3.4 Person in charge

This plan should be managed by the following persons:

- Spill Response Team Leader;
- ARL;
- Construction contractor during work phase;
- Mauritius authorities:
 - Environmental Assessment Division;
 - Pollution Prevention and Control Division;
- (WRU) Water Ressources Unit.

9.1.2.4 Marine environment monitoring plan

9.1.2.4.1 Provisions to be implemented

This plan should include all the provisions of the site to ensure that the measures regarding with the marine environment: turbidity and currents, but also marine biodiversity are implemented:

- “Phy-Mar-Mit-1 / 2 / 4 / 5” and “Phy-Mar-Av-3”,
- “BioM-Mit-1 / 2” and “BioM-Av-3”.

The measures’ descriptions should be read in section 7 as this chapter doesn’t provide an exhaustive description of all measures. The following sections guide the monitoring system to be set up.

9.1.2.4.2 Current and turbidity monitoring

The current affects the extent and the direction of the turbid plume while a high turbidity level endangers corals and natural fauna.

This plan must be implemented:

- Before the working phase to evaluate initial state conditions during dry and wet season (2 months minimum each) to determine alert and stop thresholds;

- During the works phase, and measurements should begin at least one day before commencement;
- A few months after the works phase is achieved until the turbidity has returned to its original value.
-

This plan consists in the:

- Installation of a current profiler ADCP (Acoustic Doppler Current profile) and a turbidimeter;
- Measure of turbidity and current every 3 hours in 3 locations:
- In the channel between Crab Island and the mainland;
- South of Plaine Corail to monitor the entrance of Anse Quitor;
- Near the corals at the entrance of Topaze Bay (Pointe Palmiste).



Figure 188 Localization of the potential sediment discharges to the lagoon during works phase and current-meter

The performance indicators are the following:

- Turbidity:
- Duration over an alert and a stop threshold;
- Number of exceedances over a threshold;
- Maximum concentration tolerated;
- Current magnitude (m/s) and direction (°);
- Duration of reverse current > 6 hours;
- Number of exceedances over a magnitude threshold;
- Maximum magnitude tolerated.

In case of insufficient performance, the corrective measures are the following:

- Decrease of the released flow;
- Temporary stop of the sediment discharge;
- Temporary stop of the dredging;
- Implementation of depollution protocol.

Turbidity threshold will be fixed in consultation with stakeholders after the first result of the measurement campaign.

This plan should be implemented and managed by the following people:

- External Engineering consultancy will install and determine the initial state;
- Airport of Rodrigues insures the adequate state of the buoy;
- Construction and dredging company project managers for the works verify the performance indicator results in real time.
-

9.1.2.4.3 Coral Reef Protection and monitoring

This plan consists in implementing an ecological diagnosis and assessment of the health status of corals at Pointe Palmiste.

This plan must be implemented:

- Before the works phase (during 2 years)
- During the works

This plan consists in the:

- Installation of beaconing and prohibition of access + monitoring / restoration
- Communication on coral habitats and their fragility (effects of water heating, trampling, etc.) among the population and local stakeholders in order to raise awareness

The performance indicators are the following:

- Coral recovery rate;
- Algae recovery rate;
- Roughness;
- Study of coral reefs (specific richness, recovery rate, morphotypes);
- Study of fish populations (density, ecological structure, fisheries interest).

In case of insufficient performance, the corrective measures are the following:

- Decrease of the released flow;
- Temporary stop of the sediment discharge;
- Temporary stop of the dredging.

This plan should be implemented and managed by the following people:

- Shoals Rodrigues in partnership with SEMPA.

9.1.2.4.4 Marine works monitoring plan

This plan aims to ensure that the major marine biological issues in the project area are preserved (coral reef at Pointe Palmiste and marine turtles).

This plan must be implemented during the construction works.

This plan consists in:

- Visual surveillance by boat, on foot;
- Permanent exchange with the various stakeholders of the site;

The performance indicators are the following:

- Ensure that the floating boom is properly installed;
- Visual monitoring of corals at Pointe Palmiste in relation to the turbid plume;
- Monitoring of alert thresholds and work stoppage thresholds (turbidity monitoring);
- Visual surveillance of the maritime area, check for the absence of marine turtles.

In case of insufficient performance, the corrective measures are the following:

- Decrease of the released flow;
- Temporary stop of the sediment discharge;
- Temporary stop of the dredging;
- Implementation of depollution protocol;
- Ask for the optimal position of the floating boom;
- Stopping work if marine turtles are present and come to lay eggs on the beaches near the project.

This plan should be implemented and managed by the following people:

- Construction and dredging company project managers for the works verify the performance indicator results in real time.

9.1.2.5 Air quality and noise environment management and monitoring plan

9.1.2.5.1 Provisions to be implemented

This plan should include all the provisions of the site to ensure that the measures air quality and the noise environment are implemented:

- “Phy-Kar-Mit-9”,
- “Air-Mit-1 to 5”,
- and “Noi-Mit-1 & 2”.

The measures’ descriptions should be read in section 7 as this chapter doesn’t provide an exhaustive description of all measures. The following sections guide the monitoring system to be set up in order to monitor changes in air quality and noise levels to which local residents are exposed, to ensure that the recommended thresholds are not exceeded, and if so, implement the necessary measures.

The following plans should be provided and implemented by the contractor:

- Air quality management and monitoring plan,
- Noise environment management and monitoring plan.

9.1.2.5.2 Impact study recommendations

9.1.2.5.2.1 Air quality monitoring plan to be implemented during construction phase

- Monitoring of dust deposition and PM10 throughout the entire construction phase;
- Residential areas located near the site and the school are the preferred locations, as well as the locations chosen for the air quality baseline measurement campaign,

- Monitoring data must be analysed regularly and reports must be submitted periodically, in order to quickly identify an overrun of the defined thresholds. A monthly report and an annual summary are recommended. If permanent monitoring is not carried out, it is recommended to make measurements at least during the phases of work that have the greatest impact on air quality.

9.1.2.5.2.2 Noise environment plan to be implemented during construction phase

- Monitoring of noise levels throughout the entire construction phase;
- Residential areas located near the site and the school are the preferred locations, as well as the locations chosen for the noise baseline measurement campaign;
- Monitoring data must be analysed regularly and reports must be submitted periodically, in order to quickly identify an overrun of the defined thresholds. A monthly report and an annual summary are recommended. If permanent monitoring is not carried out, it is recommended to make measurements at least during the phases of work that have the greatest impact on noise environment.

9.1.2.5.3 Objectives

The monitoring plan during the construction phase and during the operational phase must identify whether the air quality and noise level thresholds remain within acceptable limits. They also make it possible to assess the effect of reduction measures, if any.

First Schedule (regulation 3)

Emission Standards

The following standards are maximum limits for the corresponding pollutant.

Pollutant	Applicable to	Standard	Applies to project (construction / operational phase)
(i) Smoke	All stationary fuel burning source	Ringelmann No. 2 or equivalent opacity (not to exceed more that 5 minutes in any period of one hour)	X
(ii) Solid particles	(a) Any trade, industry, process, industrial plant or fuel-burning equipment	200 mg/m ³	X
	(b) Any existing trade, industry process or industrial plant using bagasse as fuel	400 mg/m ³	
(iii) Sulphuric acid mist or sulphur trioxide	(a) Any trade, industry or process (other than combustion processes and plants for the manufacture of sulphuric acid)	120 mg/m ³ as sulphur trioxide	X
	(b) Any trade, industry or process in which sulphuric acid is manufactured	30 000 mg/m ³ as sulphur trioxide	
(iv) Fluorine compounds	Any trade, industry or process in the operation of which fluorine, hydrofluoric acid or any inorganic fluorine compounds are emitted	100 mg/m ³ as hydrofluoric acid	X
(v) Hydrogen Chloride	Any trade, industry or process	200 mg/m ³ as hydrogen chloride	X
(vi) Chlorine	Any trade, industry or process	100 mg/m ³ as chlorine	X
(vii) Hydrogen sulphide	Any trade, industry or process	5 ppm as hydrogen sulphide gas	X
(viii) Nitric acid or oxides of nitrogen	Any trade, industry or process in which the manufacture of nitric acid is carried out	2 000 mg/m ³ as nitrogen dioxide	
(ix) Nitric acid or oxides of nitrogen	Any trade, industry or process other than nitric acid plant	1 000 mg/m ³ as nitrogen dioxide	X
(x) Carbon monoxide	Any trade, industry or process	1 000 mg/m ³ as carbon monoxide	X

9.1.2.5.4 Performance indicators

The performance indicators to be taken into consideration are:

- the difference between the thresholds to be reached and the measured pollution and noise levels,
- the number of actions implemented if the thresholds are exceeded,

- the reduction of noise or pollutant concentration following the implementation of mitigation measures.

9.1.2.5.5 Management strategy

The monitoring plan includes the following elements:

- choice of pollutant thresholds and noise levels not to be exceeded, based on local standards or international recommendations,
- determination of the locations for the measurements, and choice of the values to be measured (pollutants, noise indicators),
- choice of a service provider,
- analysis and possible publication of the results of the measurements,
- implementation of reduction measures in the event of exceeding the thresholds.

9.1.2.5.6 Reports

It is recommended to produce monthly and/or annual reports of the results of the measurements.

These reports will detail the methodology used, the location of the measurement points, the results, the comparison with and justification for the thresholds, any mitigation measures and the monitoring of their effectiveness.

9.1.2.5.7 Person in charge

This plans should be implemented by the contractor, under ARL's control.

9.1.2.6 Biodiversity management and monitoring plans

9.1.2.6.1 Avoidance and Offset measures

"BioT-Av-1" and "BioT-Av-2" are avoidance measures and must be implemented from the detailed design under ARL's control.

"BioT-Mit-4 and 5" are referred to as a mitigation measure because of its low chance of success. However they should be managed as offset measures: from prior to the works under biodiversity specialists management, within the context of specific contracts and under ARL and RRA's control.

"BioT-Comp-6" is an offset measure to be carried out by the Rodrigues authorities throughout the island.

"BioT-Comp-7" is an offset measure to be carried out by biodiversity specialists under ARL and RRA's control.

Details of these measures are provided in section 7. Implementation managers, performance indicators and monitoring systems are described in the previous paragraph (9.1.1) and should be implemented under the control of ARL and RRA.

ARL should provide and implement:

- a management plan to follow the implementation of measures to be implemented before the works phase (BioT-Av-1 and 2 / BioT-Mit-4 and 5),
- a management plan to follow the measures to be carried out by RRA on an island scale (BioT-Comp-6 / BioT-Comp-7).

9.1.2.6.2 Mitigation measures

“BioT-Mit-3 and 8” are mitigation measures to be carried out from the beginning of works, under biodiversity specialists management, within the context of specific contracts and under ARL and RRA’s control.

The measures’ descriptions should be read in section 7 as this chapter doesn’t provide an exhaustive description of all measures.

ARL should provide and implement a management plan to manage and follow the implementation of these measures BioT-Mit-3 and 8.

9.1.2.7 Landscape management and monitoring plan

9.1.2.7.1 Measures to be carried out within the airport area and under ARL’s control

Measures “Land-Mit-1 / 2 / 3 / 4 / 5 / 6 / 8 / 9 / 10 / 15” will be implemented within the airport and works site area and should be prepared from the detailed design, then implemented by the contractor and monitored by ARL’s landscape and environment specialist.

The measures’ descriptions should be read in section 7 as this chapter doesn’t provide an exhaustive description of all measures.

The **detailed design** should include a landscape management plan for the works phase referring to the Land-Mit-4 / 6 / 8 / 9 / 10 / 15 as they address design, phasing, site organization and costs.

ARL should provide and implement a management plan to follow the implementation of measures to be implemented before the works phase

A procedure for landscape measures management and monitoring including maps should be provided **by the contractor** prior to the works. This procedure should refer to Land-Mit-1 / 2 / 3 / 4 / 5 / 6 / 8 / 9 / 10 and follow the design guidance as far as Land-Mit- / 4 / 6 / 8 / 9 / 10 are concerned.

During the construction phase, these measures should be monitored by a landscape specialist through regular (monthly) site visits. Between each visit of specialist, a weekly visit should be done in order to implement a visual check up of:

- Fences,
- General cleanliness and condition,
- Location of the storage sites,
- Plantings works.

The person in charge for the management of these procedures are the consultant and then the contractor, under ARL’s control.

9.1.2.7.2 Measures to be implemented on an island scale under RRA's responsibility

Measures "Land-Mit-11 / 12 / 13 / 14 / 16 / 17 / 18" consist in implementing actions depending on RRA's authority.

The measures' descriptions should be read in section 7 as this chapter doesn't provide an exhaustive description of all measures. They should be implemented from the beginning of works, under a landscape specialists management, within the context of specific contracts and under RRA's control.

ARL should provide and implement a management plan to follow the measures to be carried out by RRA on an island scale.

9.1.3 Emergencies management plans

Provision for Emergency Preparedness and Response is a prerequisite under section 19 of the ESS4: Community Health and Safety.

9.1.3.1 Oil spill or accidental pollution management

In the event of an oil spill on the ground, two scenarios are possible:

- The oil is contained in the topsoil;
- Oil seeps into the groundwater until it reaches the groundwater and can flow to the sea.

The karstic aquifer in Plaine Corail is very vulnerable to surface discharge (direct access to groundwater through surface cavities). Any hydrocarbon spill should be reported directly to ARL for a decision on whether to initiate the emergency plan depending on the volume of oil spilled and the nature of the surrounding soil.

The practical thresholds for significant (reportable) spills of petroleum products are usually as follows:

- Land-based spills: 70 L;
- Spills directly on water: Any amount.

In the event of an accidental spill of contaminant on the soil, if it has been able to infiltrate deeper layers, changes in groundwater quality should be monitored through monitor well network.

An Oil Spill Emergency Plan must be implemented in detail before the initial earthwork phase.

The objectives of an Oil Spill Emergency Plan are:

- To minimize the risk of spills or unplanned situations that might cause environmental harm;
- To ensure that contingency measures are in place and implemented in the event of such spills or unplanned situations.

9.1.3.1.1 Land-Contamination

During the work phase, the Oil Spill Emergency Plan should consist to:

- Stop all earthworks within a (i.e.) 10m radius of the area where the suspect material/ emission/discharge has been recorded.

- Immediately notify the site supervisor.
- Cordon off the area as practicable with a suitable barrier.
- Work shall not resume or commence within a 10m radius of the area unless authorised by the Environmental Manager and CLS.

While the risk of spills cannot be completely prevented, the risks can be minimised and are well within acceptable bounds.

There are two main potential sources of fuel spills at an airport:

- From where the fuel storage takes place
- From where the aircraft are filled

Initial Actions to be taken after Fuel Spill reported as to be prepared and presented in the Outline Fuel Spill Contingency Response Plan. The key features which should be included in the spill response are:

- identification of the source of spill;
- reporting to relevant Authorities;
- ensure the health and safety of personnel and then order an emergency shutdown measures needed to stop or minimize further spillage;
- A rapid initial assessment is conducted:
 - o Risk of harm to human health ;
 - o Probable quantity of contaminant spilled ;
 - o Type of contaminants;
 - o Location of the spill ;
 - o Probable source and cause;
- containment of leaking fuel;
- recovery and processing of free fuel;
- sampling the piezometers
- clean up methodology; and
- handling and disposal protocols.

If the spill is directed directly to the sea by runoff and not via infiltration and aquifers, a Maritime Oil Spill Response Plan to be implemented (see further).

As a perfect example for an oil spill emergency response in an airport environment, the Spill Prevention and Response policy of the Melbourne airport is proposed in detail in annex.

The response to a spill should involve four stages – Control, Containment, Contact and Clean.

9.1.3.1.1.1 Control

Immediate action should be taken to secure the site and prevent further material from spilling, but only when it is safe to do so. These actions can include:

- Turning off any ignition sources

- In the case of a punctured drum, the drum can be rolled over so the puncture is on top. This should prevent further spilling of material
- Larger containers which are leaking should be moved quickly to a bunded area
- Valves or pumps should be turned off to stop leaks from pipes and fittings

9.1.3.1.1.2 Containment

Action should be taken as soon as possible to contain the spill in order to stop the material entering stormwater drains, contaminating soil or groundwater.

- Spills should be contained using absorbent material
- Any stormwater drain should be protected first by forming a “dam” of absorbent material around the drain
- Spilled material should then be contained by forming a “dam” of absorbent material around the spill

9.1.3.1.1.3 Clean

Absorbent materials such as diatomaceous earth or polypropylene are the preferred products for the cleaning of any spills. These products absorb the spilt material leaving no residue and have no detrimental impact on the environment. A list of approved cleaning materials must be identified in the Emergency Response Plan.

All contaminated soil must be stored and disposed of in accordance with local environmental standards.

9.1.3.1.1.4 Contact

As soon as practicable, the spill must be reported to Airport Authorities (ARL) and Spill response team leader.

9.1.3.1.2 Groundwater contamination

In the most unfavourable case where the contamination reaches the karst aquifer of the Coral Plain, the following particularities of contaminant transport must be considered:

- The transport of the contaminant to the sea could be very fast
- The exact underground flow path is generally not known

9.1.3.1.2.1 Groundwater sampling

As soon as a major spill likely to reach groundwater occurs, groundwater sampling in the downstream observation wells should be implemented. The analyses will focus specifically on the nature of the contaminant.

9.1.3.1.2.2 Groundwater decontamination

A company specializing in soil and groundwater remediation should be contacted immediately to assess the situation and propose appropriate measures to address it:

- Assess the nature and extent of the contamination
- Contain contamination
- Recover the contaminant and decontaminate the aquifer
- Treat contaminated water

- Dispose of contaminated materials (soil and water)

The free phase of the hydrocarbons must be pumped as quickly and efficiently as possible by the contractor. Depending on the direction of groundwater flow, underwater resurgences must be monitored, and a Maritime Oil Spill Response Plan must be implemented.

9.1.3.1.3 Marine contamination

9.1.3.1.3.1 Containment

Action should be taken as soon as possible to contain the spill in order to stop the material entering stormwater drains, contaminating soil or groundwater.

- Spills should be contained using absorbent material
- Any stormwater drain should be protected first by forming a “dam” of absorbent material around the drain
- Spilled material should then be contained by forming a “dam” of absorbent material around the spill
- Temporary floating barriers (booms) should be used to contain marine spills

9.1.3.1.3.2 Clean

Absorbent materials such as diatomaceous earth or polypropylene are the preferred products for the cleaning of any spills. These products absorb the spilt material leaving no residue and have no detrimental impact on the environment. A list of approved cleaning materials must be identified in the Emergency Response Plan.

All contaminated soil must be stored and disposed of in accordance with current environmental standards.

If groundwater is contaminated, decontamination measures must be taken immediately. The free phase of the hydrocarbons must be pumped as quickly and efficiently as possible. Depending on the direction of groundwater flow, underwater resurgences must be monitored and an emergency plan for the containment of contamination at sea must be implemented.

If sea water is contaminated, when the benefit of the clean-up is less than the potential harm caused to remove of the spill, spilled oil products are allowed to degrade naturally. A monitoring program is implemented to ensure there are no unforeseen threats to ecosystems.

In case of a large volume threatening spills into the sea, the use of dispersants could be considered. This chemical agent aids biodegrading by forming tiny oil droplets, making them more available for microbial degradation.

Tarred sand must be removed with appropriate equipment supplied by the state or contactors and transported to a secure disposal site.

Once clean-up operations are achieved, consideration will be given to restore areas identified as having high environmental sensitivity and value.

9.1.3.2 Fire Emergency Plan

In case of a Fire Fighting event on the new runway, it is envisaged to confine the corresponding volume in a storage tank of 240 m³ to be implemented at each extremity of the new runway. The storage volume is based on the usual prevailing rules for confining water from fire fighting.

It is proposed to consider here 2 hydrants operating at a flow rate of 60 m³/h each during 2 hours.

The water from firefighting will be collected by the slot drains and conveyed to the dedicated storage tanks where it will be confined by a specific valve arrangement and evacuated later by dedicated pumping.

9.1.3.3 Archaeological or patrimonial chance find procedure

Despite the fields and fact-findings visits, the construction stages of the project are moments of possible discoveries of cultural or ethnological heritage, which are then fortuitous discoveries.

Specialists in the field, ethnologists or archaeologists, must carry out a preliminary assessment, using an open methodology, to determine whether the incidental discovery is part of the cultural or archaeological heritage. Once this has been done, and in the event of a positive response, an investigation process must be put in place. The survey is carried out according to a usual pattern. As works phase is in progress, the process must then be completed quickly.

9.1.3.3.1 Ethnological heritage (very low probability of discovery)

The first step is to manage the local populations reaction. Subcontractors must first be trained or informed on this subject so that they adopt the right attitude : to display ignorance of the presence of a heritage site, apologize, and stop all works immediately.

In the event of discovery by a worker, the approach is the same. A sitting is initiated and the work suspended. The local population must come and see by itself.

A chance discovery during the course of the work implies the urgent implementation of the entire usual investigation procedure. This will logically be followed by a further investigation and a decision on the way to manage.

It is important that the contractor uses competent people to identify the nature of the heritage. A final report should be written once the required processing has been completed.

Activities can only be resumed after information, consultation and approval of local authorities.

The contractor must provide a document specifying its internal procedure as far as chance discoveries are concerned. This may include, for example, establishing a good internal flow of information, allowing, for example, broad communication on the progress of work and the timetable for investigations.

9.1.3.3.2 Cultural / archaeological heritage

The registration of all discovery sites, carried out in a methodical manner, should include:

- The name and GPS coordinates;
- The descriptive summary of the archaeological land and material encountered, photographed and referenced,
- Suggestions for a on-site intervention if the concentration of archaeological objects is very high. However, in the case of significant layers of sediment, a thorough archaeological survey will be required. A preventive archaeological mission will then



be proposed including an initial 1 m² borehole, the depth of which depending on the sediment's thickness and stability. This first borehole will establish whether there is archaeological material in surface and stratigraphic context. If yes, a 1 m² excavation will be carried out. If the thickness of the sediment is greater than 50 cm, a dating will be proposed using the OSL (Optically Stimulated Luminescence) method. Anyway, according to the exceptional conservation of the archaeological material, it will be necessary to collect all the objects on the total surface of the site, as well as to allow a thorough study before an official delivery to the appropriate institution (museum, laboratory, etc.).

9.1.4 Summary of plans to be drawn up for environmental management during the construction phase

Table 134: Summary of Required ESMP– Environmental Plans - Construction Phase

Plan	Measures that the plan must allow to implement and monitor	Person in charge of implementation and control	Activity / Procedures to include
Site and works facilities management and monitoring plan	Wor-Fac Inf-Mit-1 to 6 Phy-Kar-Mit-1 / 2 / 3 / 4 / 6 / 8 / 10 / 11 / 12 / 13 / 14 / 15 / 16 / 19 / 20 / 21 Phy-Wat-Av/Mit-4 Phy-Kar-Mit-19 Land-Mit-7 / 8	To be implemented by the Contractor Under ARL's control	- A waste management and monitoring plan, - An excavated soil management and monitoring plan, - A hazardous material management plan, - A spill risk management plan (Phy-Wat-Av/Mit-4), - A works traffic inside and outside the works site management plan, - A fencing plan and procedure, - A plants monitoring plan
Surface stormwater run-off, drinking and wastewater management and monitoring plan	Phy-Wat-Mit-1 Phy-Wat-Comp-2 Phy-Wat-Av-3 Phy-Hyd-Mit-1	To be implemented by the Contractor Under RRA and ARL's control	- A water management plan - A desalination skid, wastewater treatment plant and ponds monitoring - A water quality monitoring
Karst monitoring plan	Phy-Kar-Mit-5 / 7 / 18	To be implemented by the Contractor Under RRA and ARL's control	- Groundwater monitoring plan - Caves monitoring plan
	Phy-Kar-Comp-17	External specialist Under ARL's control	- A plan to follow the sediments moving and storage
Marine environment monitoring plan	Phy-Mar-Mit-1 / 2 Phy-Mar-Av-3	External consultancy engineering Under ARL's control	- Current and turbidity monitoring plan
	Phy-Mar-Mit-4 / 5	Contractor Under ARL's control	- Marine Works monitoring plan
	BioM-Mit-1 / 2 BioM-Av-3	Shoals Rodrigues / SEMPA	- Coral reef protection and monitoring

Plan	Measures that the plan must allow to implement and monitor	Person in charge of implementation and control	Activity / Procedures to include
		Under ARL's control	
Air quality and noise environment management and monitoring plan	Phy-Kar-Mit-9 Air-Mit-1 to 5 Noi-Mit-1 / 2	To be implemented by the Contractor Under ARL's control	- Air quality management and monitoring plan - Noise environment management and monitoring plan
Biodiversity management and monitoring plan	BioT-Av-1 and 2 BioT-Mit-4 and 5 BioT-Comp-6 BioT-Comp-7	External biodiversity specialists / RRA services Under RRA and ARL's control	- A management plan to follow the implementation of measures to be implemented before the works phase (BioT-Av-1 and 2 / BioT-Mit-4 and 5) - A management plan to follow the measures to be carried out by RRA on an island scale (BioT-Comp-6 / BioT-Comp-7)
	BioT-Mit-3 and 8	External biodiversity specialists / Contractor Under ARL's control	- A management plan to manage and follow the implementation of measures BioT-Mit-3 and 8.
Landscape management and monitoring plan	Land-Mit-1 / 2 / 3 / 4 / 5 / 6 / 8 / 9 / 10 / 15	Detail Design Engineer and Architects ARL Under ARL's control	- A management plan to follow the implementation of measures to be implemented before the works phase (Land-Mit-4 / 6 / 8 / 9 / 10 / 15)
		Contractor Under ARL's control	- A landscape management and monitoring plan during the construction works (Land-Mit-1 / 2 / 3 / 4 / 5 / 6 / 8 / 9 / 10)
	Land-Mit-11 / 12 / 13 / 14 / 16 / 17 / 18	RRA Under RRA and ARL's control	- A management plan to follow the measures to be carried out by RRA on an island scale
Emergencies management plans		Contractor Under ARL's control	- Oil spill management plan - Fire Emergency plan - Archeological or patrimonial chance find procedure

9.2 Preliminary Social Management Plan for construction phase

The social impact assessment evaluated a number of potential impacts. The Social Management Plan (SMP) proposes actions that permit mitigation of adverse impacts or enhancement of positive impacts. These different actions are organised through plans which need to be coordinated and the implementation methods of which must be harmonised.

The SMP is primarily the articulation of the responses to the identified impacts and the expression of the willingness to work towards the social integration of the project. The primary objective is therefore twofold, on the one hand to limit degradations, on the other hand to promote sustainable development in the area of intervention of the project which allows the development of the populations and of society.

The SMP offers a number of transversal tools that facilitate the development and use of these different plans. An institutional montage is proposed which clarifies the role and responsibilities of the various actors for their implementation.

9.2.1 Preliminary Social Management Plan for construction phase

Theme / Issue : Corresponding plan	Title of the measure concerned	Description	Period of performance	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation	
<p>Communication</p> <p>Ensure a harmonious implementation of the work at all stages of its performance with all the communities directly or indirectly impacted by the project</p> <p>Communication plan</p>	SE-Comp-1- Implementation of a Resettlement Action Plan (RAP).	The RAP necessarily includes the establishment of communication with the affected communities to provide detailed information on the project, the issues it represents in general for the Rodrigues population and the issues of physical and economic displacement.	The relocation plan must be finalized before the works begin.	To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly Relocation Plan Report to be submitted by the Relocation Committee at the end of relocation plan and before resettlement.	- Number of communication activities carried out; - Number of communication media produced and distributed; - Number of organized sessions, meetings or information workshops; - Number of information activities organized.	Organise additional communication activities or meeting sessions in case of insufficient communication with involved stakeholders.	- Relocation committee appointed by and in liaison with the Executive Committee of the RRA - Airport of Rodrigues - Spokesperson of the village Sainte Marie	
	SE-Mit-3- Complaint management and internal support for relocation.	An outcome of the RAP, complaint management is the attentive listening to the affected populations regarding relocation. It must be effective and transparent in order to take into consideration and share all the grievances expressed by the communities in order to define appropriate communication and support strategies.	The complaint management plan covers the entire project: from the implementation of the resettlement plan and throughout the period of adaptation of the displaced communities.	To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly Quarterly reports to be submitted by the Relocation Committee until full adaptation of resettled population	- Number of registered complaints and reports on actions taken for complaint management.	Ensure that all registered complaints have been satisfactorily treated. If not, complaints not yet treated will have to appear positively handled in following report.	- Fishing station managers and livestock breeder users of the impacted area - Villagers of Plaine Corail (proposed resettlement location)	
	SE-Mit-5- Communication plan concerning the integration of external workers.	The project will bring in foreign and specifically qualified labour. It is important to communicate about a considerable and temporary advent of an external population and to ensure transparency concerning the hiring procedures in relation to foreign workers.	This communication plan must begin prior to the arrival of the first workers and continue throughout all of the works phase.	To be monitored by: RRA / ARL Annual reports submitted by the Airport of Rodrigues in collaboration with Rodrigues Regional Assembly that include communication measures taken on the period as well as local surveys on inhabitants as well as external workers.	- Number of communication activities carried out; - Number of communication media produced and distributed; - Number of organized sessions, meetings or information workshops; - Results of carried out surveys; - Number and qualitative details on hired people; - Number of registered complaints and reports on actions taken for complaints management.	- Organise additional communication activities in case of insufficient communication and if required through surveys results. - Ensure that all registered complaints have been satisfactorily treated. If not, complaints not yet treated will have to appear positively handled in following report.	- Executive Committee of the RRA - Airport of Rodrigues - Project managers for the works - Village committees of the airport area (Anse Quitor and Plaine Corail – Cascade Jean Louis) - Local media (radio)	
	SE-Mit-7- Communication and hiring management plan SE-Mit-8- Communication and complaint management plan connected with employment	Specific communication concerning hiring procedures should be put in place so that impacted communities are informed about job opportunities and other related information.	This communication plan must begin and continue throughout the works phase.					
	SE-Mit-10- RAP follow-up plan	This follow-up plan is a continuation of the RAP communication procedures. It implies a continuous communication strategy aimed at maintaining the link with affected	This follow-up takes place from the construction phase and continues during the period of adaptation of the displaced communities.	To be monitored by: RRA and the Resettlement Monitoring Committee of Rodrigues Regional Assembly	- Number of registered complaints and reports on actions taken for complaint management, - Qualitative evaluation according to survey results.	- Improve communication with local people according to reports' feedback. - Ensure that all registered complaints	- Relocation committee appointed by the Executive Committee of the RRA - Airport of Rodrigues - Spokesperson of the village of Sainte Marie	

Theme / Issue : Corresponding plan	Title of the measure concerned	Description	Period of performance	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
		communities throughout the adaptation period.		(with the help of an external specialized entity) Bi-annual Relocation Plan Report to be submitted by the Relocation Committee including complaints management and satisfaction surveys.		have been satisfactorily treated. If not, complaints not yet treated will have to appear positively handled in following report.	- Fishing station managers and livestock breeder users of the impacted area - Villagers of Plaine Corail (proposed resettlement location) - Optionally an independent external office
	SE-Mit-11- Community consultation plan for monitoring the evolution of the agro-pastoral system. SE-Mit-12- Support measures concerning livestock breeding techniques.	These measures relate to the communication procedures to be employed concerning the specific and important subject of adaptation of agricultural and livestock breeding techniques by all communities.	The measures occur from the resettlement of displaced villagers and continue throughout the period of community adaptation.				- Relocation committee appointed by the Executive Committee of the RRA - Rodrigues Agriculture Commission - Village Committee (Plaine Corail – Cascade Jean Louis) and non-resident livestock breeders - Possibly a specialised external entity such as an NGO
	SE-Mit-13 - Support and fishermen's complaint management plan.	These measures relate to the communication procedures to be undertaken with the fishermen's community following relocation.	The measures occur from the resettlement of displaced villagers and continue throughout the period of community adaptation.				- Relocation committee appointed by the Executive Committee of the RRA - Rodrigues fishing Commission - Fishing station managers - Airport of Rodrigues
	SE-Mit-14- Plan for consultation and support of the communities of the area concerning the development of income-generating activities. SE-Mit-15- Economic support plan for households.	These measures relate to the communication procedures to be employed with the village communities in the area in order to promote the development of income-generating activities for households by becoming aware of the initiatives that the villages and villagers would like to implement.	These measures are developed from the resettlement of displaced villagers and continue throughout the period of community adaptation.				- Rodrigues women and small entrepreneurship Commission - Rodrigues Agriculture Commission - Rodrigues fishing Commission - Airport of Rodrigues - Village committees of the airport area (Anse Quitor, Plaine Corail – Cascade Jean Louis)
Complaint management Ensure that all complaints from communities or individuals affected by the implementation of the	SE-Comp-1- Implementation of a Resettlement Action Plan (RAP).	The RAP necessarily includes the establishment of a complaint management procedure issued by affected communities as part of the resettlement process. It requires an effective and transparent complaint management mechanism so that	<i>(before work)</i>	To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly Relocation Plan Report including complaint	- Number of complaints issued; - Number of complaints satisfactorily resolved.	- Ensure that all registered complaints have been satisfactorily treated. If not, complaints not well treated will have to appear positively	- Relocation committee appointed by and in liaison with the Executive Committee of the RRA - Airport of Rodrigues - Spokesperson of the village of Sainte Marie

Theme / Issue : Corresponding plan	Title of the measure concerned	Description	Period of performance	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
Complaints management plan		the first steps are taken to provide a solid foundation for the relocation process.		management to be submitted by the Relocation Committee at the end of the relocation plan and before resettlement.		handled before works begin.	- Fishing station managers and livestock breeder users of the impacted area - Villagers of Plaine Corail (proposed resettlement location)
	SE-Mit-3- Complaint management and internal support for relocation.	The relocation complaint management process requires careful listening to affected populations. It must be effective and transparent in order to take into consideration and share all the grievances expressed by the communities in order to define appropriate communication and support strategies.	(entire project)				
	SE-Mit-8 - Communication and complaint management plan connected with employment	This measure is the implementation of an effective and transparent complaint management mechanism concerning hiring procedures during the construction phase of the project, a period during which there will likely be many employment opportunities. This process helps mitigate some potential job-related frustrations.	This communication plan must begin and continue throughout the works phase.	To be monitored by: RRA / ARL Bi-annual reports submitted by the Airport of Rodrigues in collaboration with Rodrigues Regional Assembly that include communication measures taken on the period as well as local surveys on inhabitants as well as external workers.		- Improve communication with local people according to reports' feedback.	- Executive Committee of the RRA - Airport of Rodrigues - Project managers for the works - Village committees of the airport area (Anse Quitor and Plaine Corail – Cascade Jean Louis)
	SE-Mit-10- RAP follow-up plan	This follow-up plan is a continuation of the RAP procedures. It implies a complaint management strategy concerning the following phases of the project to maintain the link with affected communities throughout the adaptation period.	This follow-up takes place from the construction phase and continues throughout the period of adaptation of the displaced communities.	To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly (with the help of an external specialized entity) Bi-annual Relocation Plan Report to be submitted by the Relocation Committee including complaint management and satisfaction surveys.	- Number of registered complaints and reports on actions taken for complaints management, - Qualitative evaluation according to survey results.	- Ensure that all registered complaints have been satisfactorily treated. If not, complaints not yet treated will have to appear positively handled in following report.	- Relocation committee appointed by the Executive Committee of the Rodrigues Regional Assembly - Airport of Rodrigues - Spokesperson of the village of Sainte Marie - Fishing station managers and livestock breeder users of the impacted area - Villagers of Plaine Corail (proposed resettlement location) - Optionally an independent external office
SE-Mit-11- Community consultation plan for monitoring the evolution of the	This measure is the implementation of an effective and transparent complaint management mechanism concerning agriculture and livestock breeding. This	The measures occur from the resettlement of displaced villagers and continue throughout the period of community adaptation.					- Relocation committee appointed by the Executive Committee of the Rodrigues Regional Assembly - Rodrigues Agriculture Commission

Theme / Issue : Corresponding plan	Title of the measure concerned	Description	Period of performance	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
	agro-pastoral system.	mechanism makes it possible to become aware of the potential discontent of individuals or communities concerning the evolutionary process of the agro-pastoral system.					- Villagers and livestock breeders of the resettlement area
	SE-Mit-13 – Support and fishermen's complaint management plan.	This plan must implement a complaint management mechanism issued by the fishermen's community following relocation.	The measures occur from the resettlement of displaced villagers and continue throughout the period of community adaptation.				- Relocation committee appointed by the Executive Committee of the Rodrigues Regional Assembly - Rodrigues fishing Commission - Relocated fishing post managers
Resettlement and compensation The set of measures to be taken for the resettlement and compensation of impacted communities must help to limit the socio-economic impacts resulting from the displacement of populations by restoring livelihoods and the standard of living of displaced people. Action plan for relocation and compensation (including the livelihood restoration plan)	SE-Comp-1- Implementation of a Resettlement Action Plan (RAP).	The RAP implements a procedure to delineate a land area prior to the organisation of the relocation of impacted villagers and compensation for farmland, pastures or even social infrastructure.	The relocation plan must be finalized before the works begin.	To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly	- Verification that the levels of compensation meet at least the international requirements (IFC standards) on the basis of a price matrix to be established under the RAP. - Results of a questionnaire on the satisfaction rate of displaced and/or compensated people.	- Ensure updating to IFC standards according to the Relocation Plan Report before resettlement, - Provide particular emphasis on unsatisfying elements that have been pointed out with the questionnaire's results.	- Relocation committee appointed by and in liaison with the Executive Committee of the Rodrigues Regional Assembly - Airport of Rodrigues - Spokesperson of the village of Sainte Marie - Fishing station managers and livestock breeder users of the impacted area - Villagers of Plaine Corail (proposed resettlement location)
	SE-Comp-2- Availability of farmland.	This measure incorporates the resettlement procedure for the replacement of farmland lost by impacted communities. This ties in with the livelihood restoration plan.	This measure must be effective before the construction phase begins.	Relocation Plan Report to be submitted by the Relocation Committee at the end of relocation plan and before resettlement.			- Relocation committee appointed by and in liaison with the Executive Committee of the Rodrigues Regional Assembly - Spokesperson of the village of Sainte Marie - Livestock breeder users of the impacted area - Villagers of Plaine Corail and village committee of Cascade Jean Louis (proposed resettlement towns)
	SE-Comp-4- Provision of pasture areas and new fishing infrastructures.	This measure incorporates the resettlement procedure for the replacement of grazing areas and fishing infrastructures lost by impacted communities. This ties in with the livelihood restoration plan.	This measure must be effective before the construction phase begins.				- Relocation committee appointed by and in liaison with the Executive Committee of the Rodrigues Regional Assembly - Fishing station managers and livestock breeder users of the impacted area - Villagers of Plaine Corail and village Committee of Cascade

Theme / Issue : Corresponding plan	Title of the measure concerned	Description	Period of performance	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
							Jean Louis (proposed resettlement towns)
	SE-Mit-10- RAP follow-up plan.	This plan is a continuation of the procedures of the RAP to maintain the follow-up procedure by keeping the connection with affected communities throughout the adaptation period.	This follow-up takes place from the construction phase and continues during the period of adaptation of the displaced communities.	To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly Bi-annual Relocation Plan Report to be submitted by the Relocation Committee including complaint management and satisfaction surveys.		- Improve communication with local people according to reports' feedback. - Ensure that all registered complaints have been satisfactorily treated. If not, complaints not yet treated will have to appear positively handled in following report.	- Relocation committee appointed by the Executive Committee of the RRA - Airport of Rodrigues - Spokesperson of the village of Sainte Marie - Fishing station managers and livestock breeder users of the impacted area - Villagers of Plaine Corail (proposed resettlement location) - Optionally an independent external office
	SE-Mit-14- Plan for consultation and support of the communities of the area concerning the development of income-generating activities.	The goal of this measure is to keep communities on a viable and sustainable socio-economic dynamic by proposing to families that they diversify their economic activities.	This follow-up takes place from the construction phase and continues during the period of adaptation of the displaced communities.	To be monitored by RRA Annual report submitted by the Small Entrepreneurship Commission of Rodrigues Regional Assembly to Airport of Rodrigues and Rodrigues Regional Assembly Executive Committee.	- Quantitative and qualitative evaluation of local development according to survey results. - Number of local set up small activities and businesses.	- Enhance local economic environment through group consultations with specific and relevant themes according to evaluation results.	- Relocation committee appointed by and in liaison with the Executive Committee of the RRA - Rodrigues women and small entrepreneurship Commission - Rodrigues Agriculture Commission - Rodrigues fishing Commission - Airport of Rodrigues - Village committees of the airport area (Anse Quitor, Plaine Corail – Cascade Jean Louis)
Community development Medium-term planning of actions that should be implemented to achieve socio-economic development goals at the local level to trigger a virtuous process of improving living conditions Community development plan	SE-Mit-9- Agricultural technical support plan. SE-Mit-11- Community consultation plan for monitoring the evolution of the agro-pastoral system.	This measure contributes to the consolidation of integration in the community environment through the support of technical services facilitating the adaptation of agricultural models and thereby promoting the viability of production. These measures contribute to consolidating the integration of communities through the support of technical services facilitating the adaptation of farming methods to the new environment and thereby promoting the viability of production.	These measures occur from the resettlement of displaced villagers and continue throughout the period of community adaptation. The measures occur from the resettlement of displaced villagers and continue throughout the period of community adaptation.	To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly (with the help of an external specialized entity) Annual report submitted by the Commission of Agriculture dealing with results obtained from field surveys and farmer consultations.	- Number of projects implemented; - Number of direct and indirect beneficiaries; - Geographical coverage of the projects implemented; - Diversity of topics discussed.	Projects reinforcement or implementation according to results obtained from field surveys and farmer consultations.	- Relocation committee appointed by and in liaison with the Executive Committee of the RRA - Rodrigues Agriculture Commission - Village committees of the airport area (Anse Quitor, Plaine Corail – Cascade Jean Louis) - Relocation committee appointed by and in liaison with the Executive Committee of the RRA - Rodrigues Agriculture Commission - Livestock breeders of the relocation area

Theme / Issue : Corresponding plan	Title of the measure concerned	Description	Period of performance	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
	SE-Mit-12- Support plan concerning livestock breeding techniques.						- Village committees of the airport area (Anse Quitor, Plaine Corail – Cascade Jean Louis)
	SE-Mit-14- Plan for consultation and support of the communities of the area concerning the development of income-generating activities.	The goal of this measure is to keep communities on a viable and sustainable socio-economic dynamic by proposing to families that they diversify their economic activities.	This follow-up takes place from the construction phase and continues during the period of adaptation of the displaced communities.	To be monitored by RRA Annual report submitted by the Small Entrepreneurship Commission of Rodrigues Regional Assembly to Airport of Rodrigues and Rodrigues Regional Assembly Executive Committee.		- Enhance local economic environment through group consultations with specific and relevant themes according to evaluation results.	- Relocation committee appointed by and in liaison with the Executive Committee of the RRA - Rodrigues women and small entrepreneurship Commission - Rodrigues Agriculture Commission - Rodrigues fishing Commission - Airport of Rodrigues - Village committees of the airport area (Anse Quitor, Plaine Corail – Cascade Jean Louis)
Public health and community safety Contribution to the mitigation of adverse impacts concerning the health and safety of local communities.	SE-Mit-16 - Communication plan for the communities and livestock breeders of the area concerning road safety.	• The objective of this measure is the implementation of a public awareness campaign for the population on road safety issues in the vicinity of construction sites.	This measure must take place from one month before the start of the site operations and must be carried out throughout the entire construction phase.	To be monitored by: RRA / ARL Annual reports submitted by the Commission of Public Health and the Commission of Transport of Rodrigues Regional Assembly to the Airport of Rodrigues and Rodrigues Regional Assembly Executive Committee.	- Number of accidents directly related to the activities of the project. - Number of pathologies detected directly related to the activities of the project.	Enhance and/or maintain communication campaigns in case of noticed accidents or detected pathologies.	- ARL - Project managers - Rodrigues health Commission - Village committees of the airport area (Anse Quitor, Plaine Corail – Cascade Jean Louis) - Media (local radio)
	SE-Mit-17- Facilitation of access to protected pedestrian lanes and safety signage management plan.	This measure is to design and construct structural elements for the protection of the public taking into consideration the risks to which they could be exposed in the vicinity of the site areas.					- ARL - Project managers - Rodrigues infrastructure commissions - Village committees of the airport area (Anse Quitor, Plaine Corail – Cascade Jean Louis)
Public health and community safety plan	SE-Mit-18- Coordination with the project managers involved in the work sites for the implementation of specific Health-Safety training.	The primary objective of this measure is to assess the health and safety risks and impacts to which affected communities are exposed and to take appropriate preventive measures.	This measure must take place from one month before the start of the site operations and must be carried out throughout the entire construction phase.	To be monitored by ARL Annual report submitted by the Airport of Rodrigues.	- Number of training and communication activities implemented - Number of accidents directly related to the activities of the project. - Number of pathologies detected directly related to the activities of the project.	Increased numbers of training and communication activities on Health and safety prevention.	- ARL - Project managers - Rodrigues health Commission
	SE-Mit-19- Communication plan for the communities concerning the importance of	The purpose of this measure is to ensure the safety of the project by prohibiting access to sites of unauthorized people and populations through promoting					- ARL - Project managers - Rodrigues health Commission - Village committees of the airport area (Anse Quitor,

Theme / Issue : Corresponding plan	Title of the measure concerned	Description	Period of performance	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
	complying with safety instructions.	awareness of potential hazards in the work area.					Plaine Corail – Cascade Jean Louis) - Media (local radio)
Health and safety of workers For the realisation of the project it does not present a nuisance to the health and safety of the workers on the site. Occupational health and safety plan	SE-Mit-18- Coordination with the project managers involved in the work sites for the implementation of specific health-safety training.	The objective of this measure is to establish a system for the protection of workers from occupational diseases and to establish a training program for workers in the project to ensure that these employees have the necessary skills to manage the risks associated with the position they are assigned to.	This measure must take place throughout the construction phase.	To be monitored by ARL	- Number of incidents involving injury or mortality; - Number of cases of work-related illnesses.	Increased numbers of training and communication activities on health and safety prevention.	- ARL - Project managers - Rodrigues health Commission - Rodrigues labour Commission
	SE-Mit-19- Communication plan for the communities on the importance of complying with safety instructions on construction sites.	The goal of this plan is to initiate measures to prevent accidents, injuries and illnesses resulting from work by minimizing the causes of these hazards as much as possible.	This measure must take place throughout the construction phase.	Annual report submitted by Airport of Rodrigues.			- ARL - Project managers - Rodrigues health Commission - Village committees of the airport area (Anse Quito, Plaine Corail – Cascade Jean Louis) - Media (local radio)
Workforce and training Encouragement to form a more rigorous workforce to improve the skills of local labour leading to economic growth linked to the creation of local jobs. Workforce management and training plan	SE-Mit-5- Communication plan concerning the integration of external workers.	These measures for the development of a management policy concerning the accommodation of external workers permit the improvement of incomes in the locations.	This measure must take place throughout the construction phase.	To be monitored by: RRA / ARL	- Number of communication activities carried out; - Number of communication media produced and distributed; - Number of organized sessions, meetings or information workshops; - Results of carried out surveys; - Number and qualitative details on hired people; - Number of registered complaints and reports on actions taken for complaints management, - Qualitative evaluation according to survey results.	- Organise additional communication activities in case of insufficient communication and if required through survey results. - Ensure that all registered complaints have been satisfactorily treated. If not, complaints not yet treated will have to appear positively handled in following report.	- ARL - Project managers - Rodrigues labour Commission - Executive Committee of the RRA - Airport of Rodrigues - Village committees of the airport area (Anse Quito, Plaine Corail – Cascade Jean Louis) - Local media (radio)
	SE-Mit-6 - Influx management plan						- ARL - Project managers - Rodrigues labour Commission - Village committees of the airport area (Anse Quito and Plaine Corail – Cascade Jean Louis)
	SE-Mit-7- Communication and hiring management plan SE-Mit-8 - Communication and complaint management plan	This measure is to showcase local skills, job opportunities and associated hiring conditions, and to foster local hiring to provide opportunities to obtain skills.	This measure must take place throughout the construction phase.	Annual reports submitted by the Airport of Rodrigues in collaboration with Rodrigues Regional Assembly that include communication measures taken on the period as well as local surveys on inhabitants as well as external workers.			- ARL - Project managers - Executive Committee of the RRA - Rodrigues labour Commission - Village committees of the airport area (Anse Quito and

Theme / Issue : Corresponding plan	Title of the measure concerned	Description	Period of performance	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
	connected with employment	This measure is to implement a worker complaint management process including the development of a labour law awareness and training program.					Plaine Corail – Cascade Jean Louis) - Local media (radio)
	SE-Mit-18- Coordination with the contractors involved in the work sites for the implementation of specific Health-Safety training.	This measure allows the provision of a secure work environment and facilitates learning and therefore the gaining of skills.	This measure must take place throughout the construction phase.	To be monitored by ARL	- Number of incidents involving injury or mortality; - Number of cases of work-related illnesses.	Increased numbers of training and communication activities on health and safety prevention.	- ARL - Project managers - Rodrigues labour Commission - Rodrigues health Commission
	SE-Mit-19- Communication plan for the communities on the importance of complying with safety instructions on construction sites.	This allows employees to be trained more quickly on safety risk issues and on the procedures applicable to project employees.	This measure must take place throughout the construction phase.	Annual report submitted by the Airport of Rodrigues.			- ARL - Project managers - Rodrigues labour Commission - Rodrigues health Commission - Village committees of the airport area (Anse Quitor, Plaine Corail – Cascade Jean Louis) - Media (local radio)

Table 135: Overall Social Management Plan for construction phase

9.2.2 Preliminary Social Management Plans to be implemented for the construction phase or prior to the works

This SMP is accompanied by monitoring and evaluation tools that are required to monitor the performance and assess its accuracy.

The different plans proposed in this document are explained and a general "framework" is given for their development. The SMP alone cannot suffice, and each of the tools must be subject to development work.

It is proposed that the Social Management Plan of the Project of expansion of the runway of Plaine Corail Airport be structured and articulated according to the following plans:

- Base camp and works site social management plan
- Communication plan
- Complaint management plan
- Action plan for resettlement and compensation (including the livelihood restoration plan);
- Community development plan;
- Public health and community safety plan;
- Occupational health and safety plan;
- Management plan for project-induced immigration,
- Workforce management and training plan.
- Base camp and works site social management plan

A management plan should be implemented after the following guidances:

- Communication to the population about the temporary nature of the facility
- Elaboration of internal rules and wide internal dissemination of these rules (prevention of harassment, rules of good conduct, etc.)
- Hiring of personnel for the maintenance of the base camp (maintenance agent, intendant, etc.) and catering services (as far as possible a local hiring)
- Regular information to local populations and companies about construction site activities
- Establishment of a system to control and regulate access to construction sites and prohibition of access by opportunists to construction sites
- Delimitation of installations and hazard signalling via pictorial panels
- Regular safety rule reminder sessions
- Informing local authorities and surrounding populations about the nature and extent of all potential risks and impacts resulting from project activities and about the procedures to be followed in the event of an accident or unforeseen emergency situation
- Raising awareness on cross-cutting issues (gender, disease protection, use of latrines, etc.)
- Specific awareness-raising on relations at work and outside the workplace (harassment, corruption, bribes and other forms of extortion)
- Organisation of awareness, prevention and treatment programmes on STI-HIV/AIDS for workers
- Display of awareness posters concerning major risks, particularly STI-HIV/AIDS, in areas regularly visited by workers
- Seek partnerships with specialized external organizations to help the company provide STI/HIV/AIDS training, awareness campaigns and treatment to employees, their dependents and, possibly, the general population

- Establishment of a on-site care centre to provide routine medical services required by eligible employees and other persons and emergency response in the event of an accident, in order to stabilize the injured person for transfer to an appropriate medical centre
- The company will be asked to prepare an emergency evacuation plan in the event of a serious accident. The medical team will be placed under the responsibility of an emergency doctor. An Internal Operation Plan and a Health, Safety and Security Plan should be implemented
- Strict control of drivers' skills when hiring and driving for excessive speed or drunkenness, for which exemplary and dissuasive punishment should be applied
- Implementation of adequate signage.

9.2.2.1 Communication plan

9.2.2.1.1 Management issues

In order to maintain good relations with all the stakeholders affected by the project and to promote a harmonious integration of the project in the environment, it is essential to establish operational channels and strategies for communication enabling an ongoing dialogue and information flow between the project's developers and the affected communities.

9.2.2.1.2 Impact study recommendations

The social impact study emphasizes a number of avenues of action to stabilize and improve the communication loop between the project and the communities, and to establish a specific mechanism to:

- Organize information meetings at the level of the towns affected by the project (to be incorporated into mitigation plans SE-Comp-1, SE-Mit-3, SE-Mit-5, SE-Mit-7, SE-Mit-10, SE-Mit-11, SE-Mit-12, SE-Mit-13, SE-Mit-14, SE-Mit-15, SE-Mit-16 and SE-Mit-19);
- Use an effective and transparent complaint management mechanism at project level and communicate this mechanism to the towns impacted by the project activities (integrated into mitigation measures SE-Comp-1, SE-Mit-3, SE-Mit-8, SE-Mit-10, SE-Mit-11 and SE-Mit-13);
- Develop and adopt a continuous and transparent communication strategy concerning the issues of displacement and relocation (the various mitigation plans take into consideration communication concerning issues related to the habitat, the various sectors of activity such as agriculture, livestock and fisheries, employment, health and safety. These communication measures are implemented at the beginning of the project, during the construction phase, and maintained for certain measures – measures SE-Mit-3, SE-Mit-10, SE-Mit-11, SE-Mit-13, SE-Mit-14 and SE-Mit-15);
- Communicate transparently about the procedures for direct and indirect hiring of the project (opportunities, skills and education levels required – mitigation measures SE-Mit-5, SE-Mit-7 and SE-Mit-8);
- Establish a framework for consultation with regular meetings (local authorities, communities, airport, Rodrigues government) to address public development initiatives (notably through measures SE-Mit-7, SE-Mit-14, SE-Mit-15 and SE-Mit-18).

9.2.2.1.3 Objectives

The guidelines of the communication plan to be established are intended to ensure a smooth implementation of the work at all stages of its performance.

9.2.2.1.4 Performance indicators

The performance indicators to be taken into consideration in the communication plan are:

- The number of communication activities carried out;
- The number of communication media items produced and distributed;
- The number of organized sessions, meetings or information workshops;
- The number of information activities organized.

9.2.2.1.5 Management strategy

A communication plan will be prepared and put in place. A community relations officer will be appointed.

The information should be communicated on a regular basis in an understandable and accessible way to stakeholders. The communication strategy should be tailored to the linguistic preferences of the affected communities, their decision-making process and the needs of vulnerable or disadvantaged groups.

The communication plan includes the following elements:

- Identification of stakeholders: i.e. each group or person affected and/or concerned by the work;
- Choice of the appropriate mechanisms for communicating and disseminating information, which may include individual meetings, design, at the organisational level, of the role of a community liaison officer, the use of local media, etc;
- Elaboration of a timetable for the implementation of the communication and dissemination of information in relation to the planned activities and according to the target audiences.
- Identification of the necessary resources and responsibilities of each stakeholder.

9.2.2.1.6 Follow-up

It is essential to establish a follow-up process to ensure that the actions of the plan are actually put in place.

9.2.2.1.7 Reports

The contents of the reports prepared must show:

- A communication and information dissemination plan;
- A report of each of the meetings and communication actions organized;
- Quarterly and annual reports from the project holder, taking stock of the activities carried out.

9.2.2.2 Complaints management plan

9.2.2.2.1 Management issues

In order to establish and maintain a good relationship with the surrounding communities during the implementation of the project, the Developer must permit these communities to share their views, interests and concerns concerning the work to be done.

9.2.2.2.2 Impact study recommendations

For a social impact study, the recommendations for structuring a complaint management plan are to:

- Establish a complaint management mechanism that is widely known to local stakeholders (local authorities and populations affected directly or indirectly by the project) and works in an efficient and transparent manner (to be integrated specifically in the plans for mitigation measures SE-Comp-1, SE-Mit-3, SE-Mit-8, SE-Mit-10; SE-Mit-11 and SE-Mit-13);
- Use an effective and transparent complaint management mechanism at project level and communicate this mechanism to the authorities and towns impacted by the project activities.

9.2.2.2.3 Objectives

The main objective of a complaint management plan is to ensure that all complaints from communities or individuals affected by the implementation of the project are received, reviewed and that appropriate action is taken within a reasonable period to arrive at a mutually acceptable solution.

9.2.2.2.4 Performance indicators

The performance indicators to be taken into consideration during the communication plan are the:

- Number of complaints issued per month;
- Number of complaints per month satisfactorily resolved.

9.2.2.2.5 Management strategies

The complaint management strategy is based on the following principles:

- the procedure for making a complaint and to whom it should be made must be transparent and presented to communities according to their language preference. This procedure should be widely disseminated to the communities that could potentially be affected by the implementation of the project. The communication can be made verbally and/or in writing;
- the channels of communication between the parties must remain open until the situation is resolved to the satisfaction of both parties;
- all claims or complaints from the communities and the reactions or responses proposed must be described and classified in a register.

Community or individual claims will be subject to the following procedure:

- Receipt: the claims received verbally or in writing by the project managers are directed within 24 hours of receipt to a single point of contact;
- Preliminary assessment: when the claim is urgent and requires immediate response, and the community relations officer cannot respond to it, it shall be communicated promptly to a manager appointed by the project;

- Registration: the person in charge of the community relations registers all the claims and the correspondence and actions taken on this subject;
- Transmission: If the complaint cannot be resolved on the spot, the community relations officer informs his supervisor within the project management to immediately initiate a resolution process;
- Acknowledgement of receipt: the community relations officer shall send a written reply to the requestor within 48 hours to acknowledge receipt of the claim. The letter provides detailed information about the complaint itself (subject, explanation, people concerned, etc.) and the steps that will be taken and the estimated time to resolve the claim. The content of the correspondence is also verbally addressed to ensure that the members of the affected community have a good understanding;
- Evaluation meeting: if necessary, a meeting is organized with the person/group who has filed the claim to discuss and try to clarify and resolve the matter;
- Conflict resolution meeting: If the issue is not resolved to the satisfaction of all parties at the evaluation meeting, a more expanded meeting is organized, involving other institutions that can act as mediators in the resolution of the dispute (specialised commissions);
- Meeting of the administrative authorities: If the matter is still unresolved, another expanded meeting comprising the participation of the administrative authorities (Regional Assembly) is organised;
- Legal action: as a last resort, a lawsuit could be brought by the parties concerned, after all other possible avenues of dispute resolution have been exhausted.

9.2.2.2.6 Follow-up

In order to ensure proper monitoring of a complaint management plan, it is necessary to:

- Maintain a register and ensure that all complaints have been addressed;
- Ensure that investigations are completed within seven days of receipt of a complaint.
- Ensure that complaints are processed and resolved within one month of receipt.

9.2.2.2.7 Reports

The contents of the reports prepared must show:

- A complaint registration form containing at least the following pieces of information:
 - unique file number;
 - time and date of receipt of the complaint;
 - nature and description of the complaint;
 - means of communication (telephone, letter, visit, verbal communication);
 - person in charge of the case;
 - name, address, contact details and signature of the complainant;
 - name, address, contact information and signature of the witness(es);
 - follow-up and investigation carried out after the complaint was lodged;
 - actions undertaken and signature of the person having examined the complaint;
 - agreement leading to the closure of the file (including the complainant's signature).
- Monthly reports from the community relations officer reporting the number of complaints and the status of the conflict resolution process.

9.2.2.3 Resettlement Action Plan and compensation (including the livelihood restoration plan)

A framework Resettlement Action Plan (RAP) must be completed following the completion of the ESIA. This framework RAP will be based on the recommendations of the ESIA, in order to

integrate in a coherent and harmonious way the actions already undertaken in the area of resettlement and compensation by the regional authorities of Rodrigues.

The framework RAP will review each of these data, define, deepen and refine them to form a reference document for the implementation of the RAP.

9.2.2.3.1 Management issues

The project will cause involuntary displacement, both physical and economic. In order to compensate for these impacts, the project is committed to the implementation of procedures for the inventory of assets and spaces allocated, valuation of their value, identification of rights holders, distribution of compensation and support for the livelihoods of displaced populations. Impact study recommendations

For a social impact study, the recommendations for the implementation of an action plan for relocations and compensations are to:

Ensure that the implementation of the Resettlement Action Plan (RAP) is in line with the project's commitments for the resettlement and restoration of livelihoods and IFC standards (notably through mitigation measures SE-Comp-1 and SE-Mit-10);

- Clarify the delimitation of land boundaries and right-holders prior to the compensation process (mitigation measures SE-Comp-1, SE-Comp-2 and SE-Comp-4);
- Conduct consultations with potentially impacted villages to prepare for the implementation of the Resettlement Action Plan;
- Organize restitution of farmland areas to the communities of the towns (mitigation measure SE-Comp-2 and SE-Comp-4);
- Compensate land and infrastructure on the basis of a plan to manage individual and community compensation by land as much as possible, cover losses incurred for both individuals and the community (other solutions can be studied in the development of the RAP and through the recommended mitigation measures SE-Comp-2 and SE-Comp-4);
- Develop a Livelihood Restoration Plan for communities that will be affected by "economic displacement" (loss of property and/or livelihoods) and establish a monitoring-assessment program of the socio-economic conditions of displaced people;
- Support the diversification of income-generating economic activities in the context of the Livelihood Restoration Plan so that people affected by the project can regain sustainable livelihoods and possibly invest in these activities a part of the financial indemnifications resulting from the RAP (and in particular through mitigation measures SE-Comp-2, SE-Comp-4 and SE-Comp-14);
- Compensate for all farmland affected by the project, cover losses incurred on the basis of the economic reality of the study area, both for individual and community right holders (measures SE-Comp-1 and SE-Comp-2);
- Integrate compensation mechanisms for impacted livestock breeders (measures SE-Comp-1 and SE-Comp-4);
- Integrate compensation mechanisms for fishermen impacted by the activities of the project (measures SE-Comp-1 and SE-Comp-4);
- Search for, to the extent possible, replacement farmland to permit displaced populations to have sustainable livelihoods (measure SE-Comp-2);
- Search for land to accommodate physically displaced people and organise relocation (through measures SE-Comp-1 and SE-Comp-4);
- Replace any social infrastructure that will be destroyed or the method of operation of which will be altered by the project (by measure SE-Comp-1);

- Support projects for the development of income-generating activities aimed at internally displaced people, in particular people displaced due to economic reasons (measure SE-Mit-14).

9.2.2.3.2 Objectives

The objectives of the RAP may be as follows:

- Avoid or minimize, as much as possible, involuntary relocation and the acquisition of land, by studying all viable alternatives, during the design of the project;
- Mitigate the adverse social and economic impacts resulting from the acquisition of land;
- Improve, or at least maintain the means of subsistence and the standards of living of the displaced people;
- Ensure that the affected people are consulted and are given the opportunity to participate in all the crucial stages of the process of elaboration and implementation of the activities of involuntary relocation and compensation.
- Ensure that the compensation is commensurate with the impacts suffered, in order to verify that no person affected by the project is disproportionately penalized.
- Ensure that the affected people, including people identified as vulnerable, are assisted in their efforts to improve their means of existence and their standards of living, or at least to re-establish them to their pre-relocation level or at their level prior to the start of the project, whichever is the most advantageous for them.

9.2.2.3.3 Performance indicators

The performance indicators to be taken into consideration during the action plan for relocations and compensations are:

- Compensations that meet at least the international requirements (IFC standards) on the basis of a price matrix to be established in the framework RAP;
- Results of a questionnaire on the satisfaction rate of displaced and/or compensated people.

9.2.2.3.4 Management strategy

- For each phase of the implementation of the RAP, the project will endeavour to promote and implement the following guiding principles:
 - Recognition of the rights of occupation, use and administration;
 - Development of a set of resettlement measures adapted to each household;
 - Collective, non-monetary compensation at the community level;
 - Compensation at their value for impacts on assets, crops and means of subsistence (agriculture, livestock breeding and fishing, in particular)
 - Relocation sites of selected displaced towns in a community-driven process;
 - Possibility of resettlement of households by themselves against financial compensation or reconstruction by the project.

In order to comply with these principles, the RAP must therefore include the procedure for announcing a deadline, the principles governing the identification of people affected by the project (PAP), the land and property affected. An eligibility matrix will bring together the latest information. A calculation method permits one to evaluate the losses caused by the project and on the other hand to assess the amount of compensation. For each of the properties, lands and activities that can be impacted, an assessment of their cost must be carried out. The valuation method will take into consideration the values of residential buildings, all other infrastructures (fences, commercial infrastructures, etc.), crops (annuals as well as perennials, native trees, etc.), land (land construction, agricultural, etc.) and the shortfall that could result in relation to an activity.

The various stages of implementation of the RAP are different depending on whether it is compensation for economic displacement or physical displacement:

- Compensation for economic displacement
- Identification of the project's boundary area and announcement of the deadline;
- Identification of impacted people, lineages and communities;
- Calculating the values of the damage caused by the project;
- Definition of the type of compensation and negotiation with the PAP;
- Definition of the form of payment and execution of the compensation;
- Follow-up and closure of the process.
- Compensation for physical displacement (relocation)
- Identification of the starting areas
- Identification of the arrival areas
- Acquisition and preparation of resettlement sites
- Compensation for host communities
- Relocation
- Monitoring and closing the relocation

The institutional montage must be detailed and permit everyone to play the role assigned to them (Airport, Regional Assembly, Commissions, communities). A timetable, budget and monitoring and evaluation procedures should be included in the RAP document.

9.2.2.3.5 Follow-up

A monitoring and evaluation procedure should permit:

- The monitoring of the execution of compensation and relocation process (verification of the level of execution and its quality);
- The monitoring of the impacts of the PARC (verifying the achievement of objectives and redefining them when necessary).

9.2.2.3.6 Reports

The reports to be edited to facilitate the follow-up of the process established are:

- RAP guidelines document;
- RAP implementation report;
- Evaluation monitoring reports.

It should be noted that relocation provisions of the populations affected by the project have already been undertaken by the Rodrigues authorities through the Executive Committee of the Rodrigues Regional Assembly which has specifically established a Relocation Committee with the objective of preparing, organising and implementing the RAP of the communities identified as directly impacted by the project. As all the actions already undertaken follow in part the international standards mentioned above, the challenge is then to verify that the procedures undertaken are consistent with the requirements.

9.2.2.4 Community development plan

9.2.2.4.1 Management issues

Measures to support the reconstitution of an economic and productive situation favourable to the families affected by the project, both in the area directly impacted and in the areas proposed as relocation areas, must be planned and implemented.

9.2.2.4.2 Impact study recommendations

Recommendations for the implementation of community development support measures are to:

- Promote local economic development initiatives to accompany the people and communities affected by the project (specifically for measure SE-Mit-14);
- Reinforce or create income-generating activities, in particular those carried out by women (measure SE-Mit-14);
- Develop programs to support economic diversification and the development of income-generating activities (e.g. crafts, trade, services and processing of agricultural and fishery products) (measure SE-Mit-14);
- Develop programs to support agricultural and agro-pastoral development in order to make the best use of the territory's resources and adapt land uses (measures SE-Mit-9, SE-Mit-11 and SE-Mit-12);
- Support livestock breeding by allowing for the creation of water points and creating fodder perimeters for livestock (measure SE-Mit-12);
- Improve access to water in proposed areas such as the resettlement areas (measures SE-Mit-9 and SE-Mit-12).

9.2.2.4.3 Objectives

The CDP is to be constructed with the communities and aims to plan in the medium term the actions that should be implemented to achieve socio-economic development goals at the local level. It is intended to trigger a virtuous process of improving living conditions in the host communities of internally displaced people, benefiting resettled families and host families equally.

9.2.2.4.4 Performance indicators

Indicators that can highlight the performance of the community development plan are:

- The number of projects implemented within the framework of the CDP;
- The number of direct and indirect beneficiaries of projects implemented within the framework of the CDP;
- The scope of projects implemented within the framework of the CDP;
- Geographical coverage of projects implemented within the framework of the CDP;
- The diversity of the topics addressed by the projects implemented within the framework of the CDP (health, education, access to water, transport, agriculture, livestock, fisheries, market gardening, economic diversification, income-generating activities...).

9.2.2.4.5 Management strategy

The CDP should be developed and implemented on the basis of the following aspects:

- The methods of project selection and allocation of budgets: the choice of projects must be based on a participatory approach, in particular in terms of prioritisation.
- Implementation methods: the realisation of tenders, the selection of contractors, of partners for implementation and of control officers must be controlled by the local administrative Entities as much as possible and be monitored by the populations.
- The monitoring and control methods: communities must be equipped with tools and means to ensure that the projects are properly implemented, in articulation and with the support of the administrative authorities and the committees that provide control over the assignment and execution of projects. The monitoring of the execution must be based on simple and measurable performance indicators.



- The system of communication and transparency: the most complete and broadest communication is the first safeguard against misuse of funds. It also makes it possible to obtain a broad membership of the people in the project.
- Monitoring and assessment of impacts: in the same way as monitoring of implementation must be carried out, monitoring to measure achievement of objectives and effectiveness of actions is necessary. The local authorities, through the specific established committee bringing together those responsible for the various themes involved, must be able to carry out the monitoring of the impacts. A budget must be allocated to it and it must allow for a regular period to carry out an external audit.

9.2.2.4.6 Reports

The reports to be drafted to facilitate the follow-up of the community development plan to be implemented are:

- CDP strategy and guidance documents;
- Implementation reports of projects funded in the context of the CDP;
- Annual reports of implementation of the CDP.

9.2.2.5 Public health and community safety plan

9.2.2.5.1 Management issues

A construction project usually leads to an increase in the movement of vehicles and construction equipment which undeniably increases the risk of road accidents. Local communities are often users of the sides of the road and especially young people during school periods. They must consequently be made aware of the fact that there are no road-side adaptations to prevent this risk. This implies then that actions to prevent, inform and raise awareness of health and safety must be put in place for the attention of the communities.

9.2.2.5.2 Impact study recommendations

The recommendations for the establishment of a public health and safety plan for communities are to:

- Design and construct the structural elements of the project, taking into consideration the risks to workers and affected communities (measures SE-Mit-16 and SE-Mit-17);
- Implement a public awareness campaign for the population on road safety issues in the vicinity of construction sites (measure SE-Mit-16);
- Ensure the infrastructure of the project in order to limit untimely penetrations that could generate accidents (which can be taken into consideration with measures SE-Mit-18 and SE-Mit-19);
- Prohibit access to sites of unauthorized people (measure SE-Mit-19);
- Assess the health and safety risks and impacts to which affected communities are exposed and take appropriate preventive measures, this includes developing a community health and safety plan and a work health and safety plan (measures SE-Mit-18 and SE-Mit-19).

9.2.2.5.3 Objectives

The objective of the community health and safety plan is to contribute to the mitigation of negative impacts on the health and safety of local communities.

9.2.2.5.4 Performance indicators

Indicators to highlight the performance of the community's public health and safety plan are:

- The number of pathologies detected directly related to the activities of the project.
- The number of accidents directly related to the activities of the project.

9.2.2.5.5 Management strategies

In the areas of community health and safety, two types of actions can be proposed:

- Physical safety related to traffic and the movement of machinery and trucks in the construction phase;
- Awareness, training and safety information related to road use during the construction phase. The sessions will be addressed in particular to young people and children from families resettled near the paved road.

9.2.2.5.6 Follow-up

The monitoring and evaluation of the public health and safety plan should permit to:

- Ensure the monitoring of accident cases;
- Ensure the monitoring of the health status of communities in relation to existing healthcare infrastructures.

9.2.2.5.7 Reports

The reports to be drafted to facilitate the follow-up of the process established are:

- A safety strategy document;
- An intervention strategy document in the area of community health.

9.2.2.6 Occupational health and safety plan

9.2.2.6.1 Management issues

The project to build a large scale infrastructure involves many works that can affect the health and safety of workers, so this is an essential issue to consider for the success of the project.

9.2.2.6.2 Impact study recommendations

The recommendations for the establishment of a public health and safety plan are to:

- Establish a system of protection of workers against occupational diseases (screening of nuisance factors, regular medical visits of workers, etc.) (in connection with measure SE-Mit-18);
- Establish a project worker training program to ensure that these employees have the skills, information and capabilities to manage the risks associated with the position to which they are assigned (measure SE-Mit-18);
- The goal of this plan is to initiate measures to prevent accidents, injuries and illnesses resulting from work by minimizing the causes of these hazards as much as possible. (measures SE-Mit-18 and SE-Mit-19)
- Equip workers with all the necessary protective equipment to minimize the risks associated with the tasks carried out in the course of their employment (measures SE-Mit-18);
- Develop the health/safety culture of project workers and raise awareness of risks and their mastery (measure SE-Mit-19).

9.2.2.6.3 Objectives

The objectives of the occupational health and safety plan are to:

- Ensure that the realisation of the project does not harm the health and safety of employees;
- Take the necessary measures to prevent accidents, injuries and illnesses related to/or caused by the activities of the project by minimizing, to the extent possible, the risks.

9.2.2.6.4 Performance indicators

The indicators for measuring the performance of the occupational health and safety plan during the runway construction project are as follows:

- The number of incidents involving injury or mortality;
- The number of cases of work-related illnesses.

9.2.2.6.5 Management strategies

During the construction phases, management strategies related to the occupational health and safety management plan are to:

- Raise awareness, through adequate training, of all staff concerning health and safety, in order to minimize all risks of incidents, accidents and illnesses

- Ensure the presence of a medical team with basic equipment and medications to address any health problems or incidents of a minor nature;
- Ensure the presence of rapid and reliable evacuation of the wounded to a health centre adapted to the seriousness of the situation;
- Ensure the availability of a means of transportation for the urgent evacuation of a serious casualty or patient to a recognized hospital;
- Ensure that appropriate and easily understandable signage by the local population will be installed near the project sites to identify potential safety hazards.
- Ensure that any new employee is sensitized and trained in the health safety plan before commencing his activities;

9.2.2.6.6 Follow-up

The monitoring and evaluation process of the worker health and safety plan consists of:

- Analysis and risk management through the implementation of systemic practices to identify, assess, control, prevent and minimize the hazards and risks associated with the process and service activities and products, and resulting consequences;
- Monitoring of incidents and accidents as well as workplace illnesses, impacting the health or safety of workers;
- Regular assessment of the effectiveness of the health and safety measures put in place;
- The proposal, if any, of new measures to control or reduce recurrent health and safety problems.

9.2.2.6.7 Reports

The reports and documents to be drafted to facilitate the follow-up of the process are:

- Occupational Health and Safety Report
- Register of incidents, accidents and non-conformities
-

9.2.2.7 Workforce management and training plan

9.2.2.7.1 Management issues

The project must establish and encourage rigorous workforce management that maximizes local economic benefits without compromising the quality of the work.

The project will generate temporary jobs during the construction phase. A preference for the assignment of jobs should be directed towards the citizens of Rodrigues and especially the citizens of the communities close to the airport area.

9.2.2.7.2 Impact study recommendations

Recommendations for the implementation of a workforce management and training plan are to:

- Develop and implement a workforce management plan that includes:
- a description of working conditions and hiring conditions (measure SE-Mit-7);
- a management and quality policy concerning the accommodation of external workers (measures SE-Mit-5 and SE-Mit-6);
- a worker complaint management process (measure SE-Mit-8);
- the provision of a safe and healthy working environment (measure SE-Mit-18);
- a worker awareness program that includes ways of informing workers about their rights through training or communication campaigns (measure SE-Mit-8);

- Ensure the implementation of a recruitment policy favouring local citizens with the goal of prioritizing the resettled people of the project and the affected local communities (measure SE-Mit-7);
- Prepare a training program for employees and a training plan for communities in collaboration with regional administrative authorities;
- Carry out an inventory of local skills within the framework of the training and skill-building action plan in order to prioritise the employment of those directly affected by the project (measure SE-Mit-7);
- Ensure that employees are continuously trained on the following subjects (measure SE-Mit-18 and SE-Mit-19);
- training in relation to the performance of work specific to each position;
- specific training for each task for any new assignment;
- knowledge of the risks associated with the work and the current health and safety procedures;
- understanding of the appropriate procedures associated with the use and handling of hazardous materials;
- knowledge of hiring conditions and personnel rights;
- knowledge of emergency procedures and training related to this topic;
- knowledge of the workers' code of conduct;
- Train employees as soon as they are admitted to the project and on an ongoing basis over the life of the project concerning safety risk issues and the procedures applicable to project employees (measure SE-Mit-19).

9.2.2.7.3 Objectives

The main objectives in a workforce management and training plan are to:

- Establish and maintain a good working relationship between the project, its partners, subcontractors and workers;
- Promote equal opportunities and equitable treatment of workers;
- Encourage the economic growth of the region of implementation of the project by creating local jobs.

9.2.2.7.4 Performance indicators

In order to measure the performance of the workforce management plan and the training established, consideration should be given to:

- The number of complaints issued or non-conformities identified;
- The number of satisfactory settlements within one month.

9.2.2.7.5 Management strategies

The strategies to be established for the workforce and training management plan concern:

- A hiring policy: with equal skills, all recruitments will respect the order of priority in order to encourage job creation within the populations directly affected by the project;
- Hiring procedures: in addition to be posted in the project information office, labour needs will be disseminated in nearby towns;
- Working conditions and terms of employment: the project and the selected contractors will provide in writing an employment contract to all employees. This contract will include the terms and conditions of work: remuneration, hours of work, overtime, holidays and sick leave, etc;
- Representation of workers and grievance management: according to the national labour code.



- Training: all project staff, including those working for contractors, subcontractors and suppliers, must have the necessary skills and must be aware of the risks associated with their work, their responsibilities for managing these risks and the plans, procedures or instructions that must be followed in relation to the management of these risks.
- Subcontractors: all requirements of the GSP and all operational controls developed under the management system will also apply to all contractors and subcontractors responsible for the design, construction, operation or closure of the project. By extension, these requirements will also be applied to suppliers of goods and services to the project.

9.2.2.7.6 Follow-up

To ensure the monitoring the workforce management plan and training, it is necessary to:

- Regularly check the number of local jobs created in the project activities in the mining, road and port areas using indicators;
- Check the complaints register regularly, to ensure that actions have been taken to resolve the various cases.

9.2.2.7.7 Reports

Reports on the workforce and training management plan will be required to document monthly complaints, grievances, strikes, etc. and the measures put in place to resolve disputes.

9.2.3 Summary of plans to be drawn up for social management during the construction phase

Table 136: Summary of Required ESMP– Social Plans - Construction Phase

Plan	Measures that the plan must allow to implement and monitor (see description in section 7 and ESMP above)	Person in charge of implementation and control
Base camp and works site social management plan	-	Contractor + ARL
Communication plan	SE-Comp-1 SE-Mit-3 SE-Mit-5 SE-Mit-7 SE-Mit-8 SE-Mit-10 SE-Mit-11 SE-Mit-12 SE-Mit-13 SE-Mit-14 SE-Mit-15 (and take into account SE-Mit-16, SE-Mit-18, SE-Mit-19)	<ul style="list-style-type: none"> - Relocation committee appointed by and in liaison with the Executive Committee of the RRA - ARL - Spokesperson of the village Sainte Marie - Fishing station managers and livestock breeder users of the impacted area - Villagers of Plaine Corail (proposed resettlement location) - Executive Committee of the RRA - ARL - Project managers for the works - Village committees of the airport area (Anse Quitar and Plaine Corail – Cascade Jean Louis) - Local media (radio) - Rodrigues Agriculture Commission - Village Committee (Plaine Corail – Cascade Jean Louis) and non-resident livestock breeders - Possibly a specialised external entity such as an NGO - Optionally an independent external office - Rodrigues fishing Commission - Rodrigues women and small entrepreneurship Commission <p>To be monitored by: RRA / ARL and the Resettlement Monitoring Committee of Rodrigues Regional Assembly</p>

Plan	Measures that the plan must allow to implement and monitor (see description in section 7 and ESMP above)	Person in charge of implementation and control
Base camp and works site social management plan	-	Contractor + ARL
Complaints management plan	SE-Comp-1 SE-Mit-3 SE-Mit-8 SE-Mit-10 SE-Mit-11 SE-Mit-13	<ul style="list-style-type: none"> - Relocation committee appointed by and in liaison with the Executive Committee of the RRA - ARL - Spokesperson of the village of Sainte Marie - Fishing station managers and livestock breeder users of the impacted area - Villagers of Plaine Corail (proposed resettlement location) - Executive Committee of the RRA - ARL - Project managers for the works - Village committees of the airport area (Anse Quitar and Plaine Corail – Cascade Jean Louis) - Optionally an independent external office - Rodrigues Agriculture Commission - Villagers and livestock breeders of the resettlement area - Rodrigues fishing Commission <p>To be monitored by: RRA / ARL and the Resettlement Monitoring Committee of Rodrigues Regional Assembly (with the help of an external specialized entity)</p>
Action plan for relocation and compensation (including the livelihood restoration plan)	SE-Comp-1 SE-Comp-2 SE-Mit-10 SE-Comp-4 SE-Mit-14	<ul style="list-style-type: none"> - Relocation committee appointed by and in liaison with the Executive Committee of the Rodrigues Regional Assembly - ARL - Spokesperson of the village of Sainte Marie - Fishing station managers and livestock breeder users of the impacted area

Plan	Measures that the plan must allow to implement and monitor (see description in section 7 and ESMP above)	Person in charge of implementation and control
Base camp and works site social management plan	-	Contractor + ARL
		<ul style="list-style-type: none"> - Villagers of Plaine Corail and village committee of Cascade Jean Louis (proposed resettlement towns) - Optionally an independent external office - Rodrigues women and small entrepreneurship Commission - Rodrigues Agriculture Commission - Rodrigues fishing Commission <p>To be monitored by: RRA / Resettlement Monitoring Committee of Rodrigues Regional Assembly</p>
Community development plan	SE-Mit-9 SE-Mit-11 SE-Mit-12 SE-Mit-14	<ul style="list-style-type: none"> - Relocation committee appointed by and in liaison with the Executive Committee of the RRA - Rodrigues Agriculture Commission - Village committees of the airport area (Anse Quitor, Plaine Corail – Cascade Jean Louis) - Livestock breeders of the relocation area - Rodrigues women and small entrepreneurship Commission - Rodrigues fishing Commission - ARL <p>To be monitored by: RRA / Resettlement Monitoring Committee of Rodrigues Regional Assembly (with the help of an external specialized entity)</p>
Public health and community safety plan	SE-Mit-16 SE-Mit-17 SE-Mit-18 SE-Mit-19	<ul style="list-style-type: none"> - ARL - Project managers - Rodrigues health Commission - Rodrigues infrastructure commissions

Plan	Measures that the plan must allow to implement and monitor (see description in section 7 and ESMP above)	Person in charge of implementation and control
Base camp and works site social management plan	-	Contractor + ARL
		<ul style="list-style-type: none"> - Village committees of the airport area (Anse Quito, Plaine Corail – Cascade Jean Louis) - Media (local radio) <p>To be monitored by: RRA / ARL</p>
Occupational health and safety plan	SE-Mit-18 SE-Mit-19	<ul style="list-style-type: none"> - ARL - Project managers - Rodrigues health Commission - Rodrigues labour Commission - Village committees of the airport area (Anse Quito, Plaine Corail – Cascade Jean Louis) - Media (local radio) <p>To be monitored by: ARL</p>
Workforce management and training plan	SE-Mit-5 SE-Mit-6 SE-Mit-7 SE-Mit-8 SE-Mit-18 SE-Mit-19	<ul style="list-style-type: none"> - ARL - Project managers - Rodrigues labour Commission - Executive Committee of the RRA - ARL - Village committees of the airport area (Anse Quito, Plaine Corail – Cascade Jean Louis) - Local media (radio) <p>To be monitored by: RRA / ARL</p>

10 Environmental and Social Management Plan (ESMP) for the operational phase

10.1 Environment Management Plan for operational phase

10.1.1 Environmental Management Plan for operational phase

The following chapters aim to summarize and guide to implement all the environmental measures associated to the post-commissioning phase and the operational phase.

Some measures are part of the airport design and must be anticipated during the study phase.

Some other measures correspond to monitoring to be carried out after the end of the works for a few months, or to be permanently integrated into the airport's routine environmental management.

The measures' descriptions should be read in section 7 as this chapter doesn't provide an exhaustive description of all measures.

The first paragraph is a table listing all the commitment and measures and indicating for each one:

- when and by whom it should be initiated and carried out,
- how it should be monitored,
- and which are the indicators of success, as well as the corrective measures to be taken if the performance objectives are not met.

The second paragraph is intended to guide stakeholders in the implementation of these measures monitoring, indicating which operational plans and procedures should be established to implement and monitor the measures, and the guidelines for the preparation of these plans.

The first paragraph refers to the plan that ensures each measure implementation. The second paragraph recalls for each plan which measures it addresses.

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
Marine environment	Phy-Mar-Mit-6	Prevent spills and accidents: train staff to avoidance of spills.	-	Operational phase Emergencies prevention and management plans	Regular checking visits and tests	Zero spill	Improve training	ARL
	Phy-Mar-Mit-7	Implementing methodologies for quick confining and treatment of pollutants and protocol for depollution in case of spill	-	Operational phase In case of a spill Emergencies prevention and management plans	Monitoring of turbidity levels. Monitoring of contaminants in the water column.	Compliance to water quality prevailing threshold.	Informing of local authorities. The spill source will be immediately isolated, stopped and contained	ARL
Hydrology - Stormwater management Wastewater management / Water resource and water supply	Phy-Hyd-Mit-5	Treat chronic or accidental sources of pollution	Prevention / management of accidental pollution / water from firefighting Confining any accidental pollution / water from firefighting	Operational phase In case of a spill Emergencies prevention and management plans	Monitoring of water quality at stormwater outlet and nearby aquifer (control piezometer)	Compliance with prevailing / target standards.	Information of local authorities and implementation of remedial measures / dedicated pumping for evacuation if deemed necessary.	ARL
	Phy-Hyd-Mit-2	Stormwater network	Stormwater management for the runway before discharge at sea: Implementation of oil separator/sedimentation works on outlet	Permanent as from the commissioning of the runway Surface stormwater runoff, drinking and wastewater management and monitoring plan	The oil separator on the discharge point at sea will be equipped with an alarm to order a maintenance before leakage; monitoring of water quality at discharge at sea; regular manual sampling/analysis of outlet during discharge at sea and visual control.	Compliance with prevailing / target standards. Submission to local authorities once a month.	Discharge to be stopped if non-compliance. Informing of local authorities and implementation of remedial measures: confining / dedicated pumping for evacuation if deemed necessary.	To be implemented by the Detail Design Engineer Under ARL's control Operation Monitoring: ARL (or external specialist engineer under ARL and RRA's control)
	Phy-Hyd-Mit-3	Stormwater ditch located to restore the watershed boundary	Stormwater management and collection in a buffer storage pond to reduce peak flows before discharge at sea: Implementation of oil separator/sedimentation works before outlet into the pond.	Permanent as from the commissioning of the new runway facilities Surface stormwater runoff, drinking and wastewater management and monitoring plan	The oil separator on the inlet of the buffer storage pond will be equipped with an alarm to order a maintenance before leakage; monitoring of water quality at discharge at sea, regular manual sampling/analysis of outlet during discharge at sea and visual control.	Compliance with prevailing / target standards. Submission to local authorities once a month.	Discharge / reuse to be stopped if non-compliance. Informing of local authorities and implementation of remedial measures: confining / dedicated pumping for evacuation if deemed necessary.	To be implemented by the Detail Design Engineer Under ARL's control Operation Monitoring: ARL (or external specialist engineer under ARL and RRA's control)
	Phy-Hyd-Mit-4	Climate change adaptation: buffering storage and works facilitating infiltration	Stormwater collection in a buffer storage pond. Implementation of a water treatment plant within an integrated water management plan including reuse of treated stormwater collected.					
	Phy-Hyd-Mit-6	Vegetation of slopes and ditches and collection of infrastructures runoff						
	Phy-Wat-Av-6	Integrated water management plan	Wastewater management for the airport facilities before discharge at sea Wastewater integrated management for the airport facilities =>Implementation of a water treatment plant within an integrated water management plan including reuse of treated wastewater.	Permanent as from the commissioning of the treatment facilities Surface stormwater runoff, drinking and wastewater management and monitoring plan	Monitoring of water quality at inlet and outlet of Treatment Plant; monitoring of water quality in industrial water storage and stored water quality is maintained including disinfection; regular manual sampling/analysis (once a week) and visual control; automatic real time monitoring on main	Compliance with prevailing / target standards. Submission to local authorities once a month.	Discharge / reuse to be stopped if non-compliance. Informing of local authorities and implementation of remedial measures: confining / dedicated pumping for evacuation if deemed necessary.	To be implemented by the Detail Design Engineer Under ARL's control Operation Monitoring: ARL (or external specialist engineer under ARL and RRA's control)
Phy-Wat-Mit-7	Water treatment plant							
Phy-Wat-Mit-8	Reuse water plan							

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
					parameters usually monitored.			
			Rainwater integrated management for the airport facilities: Implementation of a water treatment plant within an integrated water management plan including reuse / treatment of rainwater harvested for drinking water production.	Permanent as from the commissioning of the treatment facilities Surface stormwater runoff, drinking and wastewater management and monitoring plan	Monitoring of water quality at inlet and outlet of Treatment Plant; monitoring of water quality in rainwater storage and stored water quality is maintained including disinfection; regular manual sampling/analysis (once a week) and visual control; automatic real time monitoring on main parameters usually monitored for drinking water production (at least pH and turbidity)	Compliance with prevailing / target standards. Submission to local authorities once a month.	Reuse to be stopped if non-compliance. Informing of local authorities and implementation of remedial measures: confining / dedicated pumping for evacuation if deemed necessary.	To be implemented by the Detail Design Engineer Under ARL's control Operation Monitoring: ARL (or external specialist engineer under ARL and RRA's control)
			Drinking Water supply integrated management for the airport facilities: Implementation of a water treatment plant within an integrated water management plan including reuse / treatment of rainwater harvested for drinking water production. Reuse and treatment of wastewater / stormwater collected if necessary.	Permanent as from the commissioning of the treatment facilities Surface stormwater runoff, drinking and wastewater management and monitoring plan	Monitoring of water quality at inlet and outlet of Treatment Plant; monitoring of water quality in drinking water storage and stored drinking water quality is maintained including disinfection; regular manual sampling/analysis (once a week) and visual control; automatic real time monitoring of main parameters (at least pH, turbidity and residual free chlorine) on distribution line.	Compliance with prevailing / target standards. Submission to local authorities once a month.	Distribution to be stopped if non-compliance. Informing of local authorities and implementation of remedial measures: confining / dedicated pumping to empty drinking water storage if deemed necessary.	To be implemented by the Detail Design Engineer Under ARL's control Operation Monitoring: ARL (or external specialist engineer under ARL and RRA's control)
Karst	Phy-Kar-Av-25	All operations involving hydrocarbons must comply with current standards to prevent spills and, if necessary, implement emergency measures	-	Operational phase Emergencies prevention and management plans	Installation of a network of observation wells upstream and downstream of the facilities to allow, on the one hand, sampling and analysis of groundwater to define reference values and, on the other hand, to establish a groundwater quality monitoring program (and levels) during the project development phases (construction and operation phases)		In the event of a surface spill, the environmental response plan must be implemented immediately. In the event that there is a significant change in groundwater quality and/or a contaminant is detected, the environmental management plan will also have to be put in place to contain the contamination.	ARL
	Phy-Kar-Mit-26	Do not allow groundwater use downstream of airport infrastructure	-	Operational phase Karst monitoring plan		Number and intensity of accidental spills of hydrocarbons and other chemicals		To be implemented by the Detail Design Engineer Under ARL's control Operation Monitoring: ARL (or external specialist engineer under ARL control)
	Phy-Kar-Av-22	Supplementary geotechnical and geophysical investigations to characterize karstic network (caves and voids)	-	Operational phase Karst monitoring plan	Periodic topographic surveys	Non-compliance with the leveling tolerances	Geophysical and/or ground investigation launching	To be implemented by ARL or an external specialist Contractor

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
	Phy-Kar-Mit/Comp-23	In situ investigation diagnostic of infilled cavities (televsual cavity inspections)	-	Operational phase Karst monitoring plan	Geophysical/geotechnical detection of underground cavity(ies)	Borehole log anomaly vertical to a levelling defect	Repair works as cavity filling/grouting	(as part of the 10-year guarantee) Under ARL's control
	Phy-Kar-Mit/Comp-24	Additional laboratory testings (Aggregate testings) to characterize erosive potential of in situ geological formations	-	Operational phase Karst monitoring plan	Detection of gully development as part of site visits	Slope instability, defect on drainage device	Slope reconstruction with coarse granular materials/Drainage system improvement works	
Infrastructures and solid waste management	Inf-Mit-7	Restore road connections	To adapt the surrounding airport routes to achieve overall network coherence	Operational phase Infrastructures and access monitoring plan	Post-commissioning assessment of persistent traffic problems	Zero additional traffic jam	Resizing of road network	To be implemented by the Detail Design Engineer and Contractor (as part of the 10-year guarantee) Under RRA and ARL's control
Air quality	Air-Mit-6	If possible, limit the taxiing distance	-	During operational phase Air quality management and monitoring plan	Air quality and noise environment Management Plan	air emission standards	-	To be implemented by ARL or external specialist engineer Under ARL and RRA's control
	Air-Mit-7	Opt for technologies that limit aircraft pollutant emissions during taxiing	-		Air quality and noise environment Management Plan	air emission standards	-	
	Air-Mit-8	Encourage pilots to shut down unneeded engines when taxiing	-		Air quality and noise environment Management Plan	air emission standards	-	
	Air-Mit-9	Limit congestion (aircraft queues) by making departures as fluid as possible	-		Air quality and noise environment Management Plan	air emission standards	-	
	Air-Mit-10	Minimize the use of the APU and GPU	-		Air quality and noise environment Management Plan	air emission standards	-	
	Air-Mit-11	Develop and implement procedures to limit the use of the thrust reverser	-		Air quality and noise environment Management Plan	air emission standards	-	
	Air-Mit-12	Make ecological performance a criterion of choice for service vehicles and ground equipment	-	Before operational phase Air quality management and monitoring plan	Air quality and noise environment Management Plan	air emission standards	-	To be implemented by the Detail Design Engineer
	Air-Mit-13	Develop an efficient public transport system to limit the use of private vehicles	-	Air quality management and monitoring plan	Air quality and noise environment Management Plan	air emission standards	-	Under ARL's control
Noise	Noi-Mit-3	Limit air traffic at night and the use of noisy equipement	-	During operational phase noise management and monitoring plan	Air quality and noise environment Management Plan	noise emission standards	-	To be implemented by ARL or external specialist engineer Under ARL and RRA's control
	Noi-Mit-4	Raise the ILS glide slope to reduce noise emissions during landing	-		Air quality and noise environment Management Plan	noise emission standards	-	
	Noi-Mit-5	Adapt departure procedures to minimize noise exposure on the ground during take-off	-		Air quality and noise environment Management Plan	noise emission standards	-	
	Noi-Mit-6	Limit the use of reverse thrust	-		Air quality and noise environment Management Plan	noise emission standards	-	
	Noi-Mit-7	Develop an efficient public transport system to limit the use of private vehicles	-	Before operational phase	Air quality and noise environment Management Plan	noise emission standards	-	To be implemented by the Detail Design Engineer

Theme / Issue	Title and ID of the measure		Complementary description	Period of performance / Corresponding plan	Performance monitoring system	Performance indicators	Corrective measures	Responsible managers for implementation
				noise management and monitoring plan				Under ARL's control
Landscape	Land-Mit-19	Set up of green and blue grids	-	Any time Landscape measures follow-up plan	Environmental study	Environmental Assessment, guidelines and final report	None	RRA
	Land-Mit-20	Set up of sustainable and resilient city guidelines and architectural guidelines	-		Designer team: landscape architect, urbanist or architect with environmentalist and sociologist	Site Assessment, guidelines and final report	None	RRA
	Land-Mit-21	Investment in woodland planting to feed the timber industry	-		Private or relevant government administration	Yearly increase in wooded surfaces	None	RRA
	Land-Mit-22	Set up sustainable timber management plan	-		Forestry expert	Timber management assessment and report	None	RRA
	Land-Mit-23	Ravine preservation and sanctuarisation of associated woodlands	-		Relevant government administration	Extent of fence + yearly cost of maintenance	None	RRA

Table 137: Overall Environmental Management Plan for operational phase

10.1.2 Environment Management Plans to be drawn up in operational phase

10.1.2.1 Surface stormwater run-off, drinking and wastewater management and monitoring plan

10.1.2.1.1 Design

The detailed design implemented during the construction should comply with the Environmental impact objectives set out in sections 5.3.10 and in section 74.1.2 where measures “Phy-Hyd-Mit-2 / 3 / 4 / 6”, “Phy-Wat-Av-6” and “Phy-Wat-Mit-7 / 8” are described.

10.1.2.1.2 Operation monitoring of measures

A monitoring system should be set up in the operational phase and integrated into the current routine inspections of the airport, with reference to the following measures described in section 10.1.1 : “Phy-Hyd-Mit-2 / 3 / 4 / 6”, “Phy-Wat-Av-6”, “Phy-Wat-Mit-7 / 8”.

The following specific tasks for operation and maintenance of the treatment plant should be included:

- Water analyses = 4h per week
- Electromechanical tasks = 4h per week per Treatment Plant + 2h per month per pumping station
- Current operation and maintenance tasks = 10h per week per treatment Plant + 2h per week per pumping station
- Oversight 24h/24h = intervention whenever required (alarm, breakdown), with remote information available, considering the implementation of a minimum remote operation monitoring equipment.

10.1.2.1.3 Persons in charge and document to provide and implement

Design measures should be designed and sized in the detailed design and implemented during the operation and followed-up by ARL. A water management plan should be provided.

Operation monitoring measures should be implemented by ARL or by an external specialist sub-consultant. This one should implement:

- A desalination plant, wastewater treatment plant and storm water management system monitoring procedure including namely regular manual sampling/analysis and visual controls.
- A water quality monitoring plan including namely regular manual sampling/analysis and visual controls.

The basic monitoring tasks should be carried out by a qualified technical worker. The specific operation and maintenance tasks for the treatment plants should be carried out by 2 skilled technicians + 1 on stand-by whenever required. The skills required include:

- A technician with good qualifications in water analysis.
- A technician with good qualifications in electromechanics.
- All O&M personnel shall have good Computer skills.

10.1.2.2 Karst monitoring plan

10.1.2.2.1 Design

The detailed design should comply with the Environmental impact objectives set out in section 7 where measure “Phy-Kar-Mit-26” are described.

The following documents should be provided or implemented:

- Sizing note and plans
- A follow-up plan to implement by ARL

10.1.2.2.2 Post-commissioning Caves Monitoring Plan

This plan aims to monitor the airport operation impact on the caves with reference to the following measures: “Phy-Kar-Av-22”, “Phy-Kar-Mit/Comp-23”, and “Phy-Kar-Mit/Comp-24”.

ARL should be responsible of this plan as it should be carried out in a coherent way before, during and after the works. A cave expert should be mandated to carry out these surveys, and could teach and coordinate the contractor and airport environment specialists in charge of the local monitoring.

During the operation phase, the same criteria and measurements should be monitored for the first 6 months (visual criteria) to 9 months (environmental criteria : air quality, moisture, water flow) after commissioning, the following monitoring should be carried out:

- Internal factors:
 - o Geological characteristics: monitoring of sedimentation compaction inside caves by visual inspection and analysis (description, thickness, sampling and analysis);
 - o Fracturation: before and after the blasts, monitoring of strata behaviour (number of fracture traces) as well as count inventory of collapsed blocks located at the ground surface of the cave will be carried out. This will be observed by visual inspection (mapping of fractures network, measurement of fractures orientation);
- External factors:
 - o Vibrations: monitoring of vibrations with seismographs located inside the caves (at ground surface and on walls of caves). (3 seismometers per main cave).
 - **Note:** In parallel and above works phase, vibration consultant to provide a blasting plan comprising hole size, depth, spacing, burden, type of explosives, type of delay sequence, maximum amount of explosive on any one delay period, depth of rock, and depth of overburden if any. The vibration consultant will not be allowed to increase the maximum explosive charge weights per delay included in the plan without the approval of the contractor and airport environment specialists. Record of each blast (date, time and location, amount of explosives used, maximum explosive charge weight per delay period) will be kept by ARL over the whole work period to be consulted by specialists.
 - o Water flow: permanent groundwater monitoring (see groundwater monitoring plan);

- Temperature, airborne moisture and airflow: general characterization of lint removal activities, analysis of dust/lint accumulation plates, analysis of airborne dust/lint. This survey needs sampling and analysis;
- Pollution traces: visual monitoring of man-induced pollution (oils, wastes, mapping/inventory of visitor impacts, monitoring of cave chemistry) observed by visual inspection and analysis (description, sampling and analysis).

This monitoring should be carried out once a month in the main caves.

The following plans and procedures should be implemented:

- A monitoring procedure to implement by the person in charge for the monitoring,
- A follow-up plan to implement by ARL.

10.1.2.2.3 Operational phase groundwater quality monitoring plan

This plan consists in keeping monitoring the network of observation wells upstream and downstream of the facilities to allow sampling and analysis of groundwater to define reference values and then to establish a groundwater quality monitoring program (and levels).

The installation of observation wells and water analyses will have been carried out before the work begins.

The water quality monitoring program will have begun during the construction phase.

During the airport's operational phase, semi-annual monitoring should be carried out under normal circumstances or more frequently in the event of a spill incident. This should be included in the routine inspection program of the airport.

In the event of a surface spill, the environmental response plan must be implemented immediately.

In the event that there is a significant change in groundwater quality and/or that a contaminant is detected, the environmental management plan will also have to be put in place to contain the contamination.

This plan should be implemented and managed by the following people:

- ARL;
- Project managers;
- Mauritius authorities:
 - Environmental Assessment Division;
 - Pollution Prevention and Control Division;
- (WRU) Water Resources Unit.

The following plans and procedures should be implemented:

- A monitoring procedure to implement by the person in charge for the monitoring and to be integrated to the current routine inspections of the airport,
- A follow-up plan to implement by ARL.

10.1.2.3 Infrastructures and access monitoring plan

This plan aims to allow to respond to measure “Inf-Mit-7”:

- firstly by providing for a redesign of the roads, routes and traffic around the airport from the design stage,
- and secondly by planning the rehabilitation of the roads used by the construction equipment at the end of the worksite.

At the beginning of the operational phase, monitoring must be put in place for one year to observe any traffic problems generated and the state of the restored infrastructure.

- A future roads and circulation map and sizing notes,
- A 1 year post-commissioning monitoring plan.

10.1.2.4 Marine biodiversity and habitats monitoring plan

This plan consists in implementing an ecological diagnosis and assessment of the health status of corals at Pointe Palmiste.

This plan must will have begun before and during the works, and then must be implemented at 1, 3 and 5 years into the operational phase.

This plan consists in the:

- Installation of beaconing and prohibition of access + monitoring / restoration
- Communication on coral habitats and their fragility (effects of water heating, trampling, etc.) among the population and local stakeholders in order to raise awareness

The performance indicators are the following:

- Coral recovery rate;
- Algae recovery rate;
- Roughness;
- Study of coral reefs (specific richness, recovery rate, morphotypes);
- Study of fish populations (density, ecological structure, fisheries interest).

In case of insufficient performance, the corrective measures are the following:

- Decrease of the released flow;
- Temporary stop of the sediment discharge;
- Temporary stop of the dredging.

This plan should be implemented and managed by the following people:

- Shoals Rodrigues in partnership with SEMPA.

The following documents should be provided and implemented:

- A monitoring procedure to implement by the person in charge for the monitoring,

- A follow-up plan to implement by ARL.

10.1.2.5 Air quality and noise environment management plans

10.1.2.5.1 Design

The detailed design should comply with the Environmental impact objectives set out in section 7 where the following measures are described:

- “Air-Mit-6 to 11”,
- “Noi-Mit-3 to 5”.

The following documents should be provided:

- Air quality management plan,
- Noise environment management plan

10.1.2.5.2 Management issues

This plan aims to guide the monitoring of the changes in air quality and noise levels to which local residents are exposed, to ensure that the recommended thresholds are not exceeded, and if so implement the necessary measures, with reference to the the following measures described in section 7

- “Air-Mit-12 / 13”,
- “Noi-Mit-7”.

- Noise environment monitoring plan

10.1.2.5.3 Impact study recommendations

10.1.2.5.3.1 Air quality

An air quality monitoring plan should be implemented including:

- The same monitoring stations as the one used during the works should be used and store main pollutants (PM2.5, PM10, SO2, CO, NO2, O3),
- It is recommended to carry out at least 2 campaigns per year, of 1 month each.

10.1.2.5.3.2 Noise environment

A noise monitoring plan should be implemented including:

- The same monitoring stations as the ones used during the works should be used. Data to be produced are at least: 24-hour L_{Aeq} , percentile levels L_n , L_{den} , L_{Amax} . The recorded levels must be correlated with aircraft movements, aircraft types and flight tracks.
- It is recommended to set up a permanent monitoring system with 1 or 2 fixed points. If not, a minimum of 2 measurement campaigns per year, of at least 1 week each, is to be expected.

10.1.2.5.4 Objectives

The monitoring plan during the operational phase must identify whether the air quality and noise level thresholds remain within acceptable limits. They also make it possible to assess the effect of reduction measures, if any.

First Schedule (regulation 3)

Emission Standards

The following standards are maximum limits for the corresponding pollutant.

<i>Pollutant</i>	<i>Applicable to</i>	<i>Standard</i>	Applies to project (construction / operational phase)
(i) Smoke	All stationary fuel burning source	Ringelmann No. 2 or equivalent opacity (not to exceed more than 5 minutes in any period of one hour)	X
(ii) Solid particles	(a) Any trade, industry, process, industrial plant or fuel-burning equipment	200 mg/m ³	X
	(b) Any existing trade, industry process or industrial plant using bagasse as fuel	400 mg/m ³	
(iii) Sulphuric acid mist or sulphur trioxide	(a) Any trade, industry or process (other than combustion processes and plants for the manufacture of sulphuric acid)	120 mg/m ³ as sulphur trioxide	X
	(b) Any trade, industry or process in which sulphuric acid is manufactured	30 000 mg/m ³ as sulphur trioxide	
(iv) Fluorine compounds	Any trade, industry or process in the operation of which fluorine, hydrofluoric acid or any inorganic fluorine compounds are emitted	100 mg/m ³ as hydrofluoric acid	X
(v) Hydrogen Chloride	Any trade, industry or process	200 mg/m ³ as hydrogen chloride	X
(vi) Chlorine	Any trade, industry or process	100 mg/m ³ as chlorine	X
(vii) Hydrogen sulphide	Any trade, industry or process	5 ppm as hydrogen sulphide gas	X
(viii) Nitric acid or oxides of nitrogen	Any trade, industry or process in which the manufacture of nitric acid is carried out	2 000 mg/m ³ as nitrogen dioxide	
(ix) Nitric acid or oxides of nitrogen	Any trade, industry or process other than nitric acid plant	1 000 mg/m ³ as nitrogen dioxide	X
(x) Carbon monoxide	Any trade, industry or process	1 000 mg/m ³ as carbon monoxide	X

10.1.2.5.5 Performance indicators

The performance indicators to be taken into consideration are:

- the difference between the thresholds to be reached and the measured pollution and noise levels,
- the number of actions implemented if the thresholds are exceeded,
- the reduction of noise or pollutant concentration following the implementation of mitigation measures.

10.1.2.5.6 Management strategy

The monitoring plan includes the following elements:

- choice of pollutant thresholds and noise levels not to be exceeded, based on local standards or international recommendations,
- determination of the locations for the measurements, and choice of the values to be measured (pollutants, noise indicators),
- choice of a service provider,
- analysis and possible publication of the results of the measurements,
- implementation of reduction measures in the event of exceeding the thresholds.

10.1.2.5.7 Reports

It is recommended to produce monthly and/or annual reports of the results of the measurements.

These reports will detail the methodology used, the location of the measurement points, the results, the comparison with and justification for the thresholds, any mitigation measures and the monitoring of their effectiveness.

10.1.2.6 Landscape measures following-up plan

The landscape measures planned in the operational phase “Land-Mit-19 / 20 / 21 / 22 / 23” (section 7) should be implemented by RRA services as they concern the entire island.

10.1.3 Emergencies prevention and management plans

10.1.3.1 Oil spill prevention prevention plan

An oil spill prevention plan should be implemented describing all the precautions, procedures, tools, actions of training, awareness-raising and check-up routine that should be scheduled in order to prevent oil spills and other pollutions, with reference to measures “Phy-Mar-Mit-6 / 7”, “Phy-Hyd-Mit-5” and “Phy-Kar-Av-25”.

10.1.3.2 Oil spill management plan

In the event of an oil spill on the ground, two scenarios are possible:

- The oil is contained in the topsoil
- Oil seeps into the groundwater until it reaches the groundwater

The karstic aquifer in Plaine Corail are very vulnerable to surface discharge (direct access to groundwater through surface cavities). Any hydrocarbon spill should be reported directly to ARL for a decision on whether to initiate the emergency plan depending on the volume of oil spilled and the nature of the surrounding soil.

The practical thresholds for significant (reportable) spills of petroleum products are usually as follows:

- Land-based spills: 70 L
- Spills directly on water: Any amount

In the event of an accidental spill of contaminant on the soil, if it has been able to infiltrate deeper layers, changes in groundwater quality should be monitored through monitor well network (see section 8.5.1.6).

An Oil Spill Emergency Plan must be implemented in detail before the initial earthwork phase.

The objectives of an Oil Spill Emergency Plan are:

- To minimize the risk of spills or unplanned situations that might cause environmental harm.
- To ensure that contingency measures are in place and implemented in the event of such spills or unplanned situations.

10.1.3.2.1 Land contamination

There are two main potential sources of fuel spills at an airport:

- From where the fuel storage takes place
- From where the aircraft are filled

Initial Actions to be taken after Fuel Spill reported as to be prepared and presented in the Outline Fuel Spill Contingency Response Plan. The key features which should be included in the spill response are:

- identification of the source of spill;

- reporting to relevant Authorities;
- ensure the health and safety of personnel and then order an emergency shutdown measures needed to stop or minimize further spillage;
- A rapid initial assessment is conducted:
 - o Risk of harm to human health ;
 - o Probable quantity of contaminant spilled ;
 - o Type of contaminants;
 - o Location of the spill ;
 - o Probable source and cause;
- containment of leaking fuel;
- recovery and processing of free fuel;
- sampling the piezometers
- clean up methodology; and
- handling and disposal protocols.

If the spill is directed directly to the sea by runoff and not via infiltration and aquifers, a Maritime Oil Spill Response Plan to be implemented.

As a perfect example for an oil spill emergency response in an airport environment, the Spill Prevention and Response policy of the Melbourne airport is proposed in detail in 14.3.

The response to a spill should involve four stages – Control, Containment, Contact and Clean.

10.1.3.2.1.1 Control

Immediate action should be taken to secure the site and prevent further material from spilling, but only when it is safe to do so. These actions can include:

- Turning off any ignition sources
- In the case of a punctured drum, the drum can be rolled over so the puncture is on top. This should prevent further spilling of material
- Larger containers which are leaking should be moved quickly to a bunded area
- Valves or pumps should be turned off to stop leaks from pipes and fittings

10.1.3.2.1.2 Containment

Action should be taken as soon as possible to contain the spill in order to stop the material entering stormwater drains, contaminating soil or groundwater.

- Spills should be contained using absorbent material
- Any stormwater drain should be protected first by forming a “dam” of absorbent material around the drain
- Spilled material should then be contained by forming a “dam” of absorbent material around the spill

10.1.3.2.1.3 Clean

Absorbent materials such as diatomaceous earth or polypropylene are the preferred products for the cleaning of any spills. These products absorb the spilt material leaving no residue and have no detrimental impact on the environment. A list of approved cleaning materials must be identified in the Emergency Response Plan.

All contaminated soil must be stored and disposed of in accordance with local environmental standards.

10.1.3.2.1.4 *Contact*

As soon as practicable, the spill must be reported to Airport Authorities (ARL) and Spill response team leader.

10.1.3.2.2 *Groundwater contamination*

In the most unfavourable case where the contamination reaches the karst aquifer of the Coral Plain, the following particularities of contaminant transport must be considered:

- The transport of the contaminant to the sea could be very fast
- The exact underground flow path is generally not known

10.1.3.2.2.1 *Groundwater sampling*

As soon as a major spill likely to reach groundwater occurs, groundwater sampling in the downstream observation wells should be implemented. The analyses will focus specifically on the nature of the contaminant.

10.1.3.2.2.2 *Groundwater decontamination*

A company specializing in soil and groundwater remediation should be contacted immediately to assess the situation and propose appropriate measures to address it:

- Assess the nature and extent of the contamination
- Contain contamination
- Recover the contaminant and decontaminate the aquifer
- Treat contaminated water
- Dispose of contaminated materials (soil and water)

The free phase of the hydrocarbons must be pumped as quickly and efficiently as possible by the contractor. Depending on the direction of groundwater flow, underwater resurgences must be monitored, and a Maritime Oil Spill Response Plan must be implemented.

10.1.3.2.3 *Marine contamination*

10.1.3.2.3.1 *Containment*

Action should be taken as soon as possible to contain the spill in order to stop the material entering stormwater drains, contaminating soil or groundwater.

- Spills should be contained using absorbent material
- Any stormwater drain should be protected first by forming a “dam” of absorbent material around the drain
- Spilled material should then be contained by forming a “dam” of absorbent material around the spill
- Temporary floating barriers (booms) should be used to contain marine spills

10.1.3.2.3.2 *Clean*

Absorbent materials such as diatomaceous earth or polypropylene are the preferred products for the cleaning of any spills. These products absorb the spilt material leaving no residue and

have no detrimental impact on the environment. A list of approved cleaning materials must be identified in the Emergency Response Plan.

All contaminated soil must be stored and disposed of in accordance with current environmental standards.

If groundwater is contaminated, decontamination measures must be taken immediately. The free phase of the hydrocarbons must be pumped as quickly and efficiently as possible. Depending on the direction of groundwater flow, underwater resurgences must be monitored and an emergency plan for the containment of contamination at sea must be implemented.

If sea water is contaminated, when the benefit of the clean-up is less than the potential harm caused to remove of the spill, spilled oil products are allowed to degrade naturally. A monitoring program is implemented to ensure there are no unforeseen threats to ecosystems.

In case of a large volume threatening spills into the sea, the use of dispersants could be considered. This chemical agent aids biodegrading by forming tiny oil droplets, making them more available for microbial degradation.

Tarred sand must be removed with appropriate equipment supplied by the state or contactors and transported to a secure disposal site.

Once clean-up operations are achieved, consideration will be given to restore areas identified as having high environmental sensitivity and value.

10.1.3.3 Fire Emergency Plan

In case of a Fire Fighting event on the new runway, it is envisaged to confine the corresponding volume in a storage tank of 240 m³ to be implemented at each extremity of the new runway. The storage volume is based on the usual prevailing rules for confining water from fire fighting. It is proposed to consider here 2 hydrants operating at a flow rate of 60 m³/h each during 2 hours.

The water from firefighting will be collected by the slot drains and conveyed to the dedicated storage tanks where it will be confined by a specific valve arrangement and evacuated later by dedicated pumping.

10.1.4 Summary of plans to be drawn up for environmental management during the operational phase

Table 138: Summary of Environmental Management Plan for operational phase

Plan	Measures that the plan must allow to implement and monitor	Person in charge of implementation and control	Activity / Procedures to include
Surface stormwater run-off, drinking and wastewater management and monitoring plan	<u>Design</u> Phy-Hyd-Mit-2 / 3 / 4 / 6 Phy-Wat-Av-6 Phy-Wat-Mit-7 / 8	To be implemented by the Detail Design Engineer Under ARL's control	- A water management plan
	<u>Operation monitoring of measures</u> Phy-Hyd-Mit-2 / 3 / 4 / 6 Phy-Wat-Av-6 Phy-Wat-Mit-7 / 8	To be implemented by ARL or external specialist engineer Under ARL and RRA's control	- A desalination plant, wastewater treatment plant and storm water management system monitoring - A water quality monitoring plan
Karst monitoring plan	<u>Design – groundwater</u> Phy-Kar-Mit-26	To be implemented by the Detail Design Engineer Under ARL's control	- Sizing note and plans - A follow-up plan to implement by ARL
	<u>Operation monitoring – groundwater</u> Phy-Kar-Mit-26	To be implemented by ARL or an external specialist Under ARL's control	- A monitoring procedure to implement by the person in charge for the monitoring - A follow-up plan to implement by ARL
	<u>Operation monitoring – caves</u> Phy-Kar-Av-22 Phy-Kar-Mit/Comp-23 Phy-Kar-Mit/Comp-24	To be implemented by ARL or an external specialist Contractor (as part of the 10-year guarantee) Under ARL's control	
Marine biodiversity and habitats monitoring plan	-	To be implemented by ARL or an external specialist Under ARL's control	- A monitoring procedure to implement by the person in charge for the monitoring - A follow-up plan to implement by ARL

Plan	Measures that the plan must allow to implement and monitor	Person in charge of implementation and control	Activity / Procedures to include
Infrastructures and access monitoring plan	<u>Design ad post-commissioning monitoring</u> Inf-Mit-7	To be implemented by the Detail Design Engineer and Contractor (as part of the 10-year guarantee) Under RRA and ARL's control	- A future roads map and sizing notes - A 1 year post-commissioning monitoring plan
Air quality and noise environment management and monitoring plan	<u>Design</u> Air-Mit-6 to 11 Noi-Mit-3 to 5	To be implemented by the Detail Design Engineer Under ARL's control	- Air quality management plan - Noise environment management plan
	<u>Operation monitoring</u> Air-Mit-12 / 13 Noi-Mit-7	To be implemented by ARL or external specialist engineer Under ARL and RRA's control	- Air quality monitoring plan - Noise environment monitoring plan
Landscape measures follow-up plan	Land-Mit-19 / 20 / 21 / 22 / 23	RRA Under RRA and ARL's control	- A management plan to follow the measures to be carried out by RRA on an island scale
Emergencies prevention and management plans	Phy-Mar-Mit-6 / 7 Phy-Hyd-Mit-5 Phy-Kar-Av-25	ARL	- Oil spill prevention and management plan - Fire Emergency plan



10.2 Social Management Plan for operational phase

10.2.1 Social Management Plan for operational phase

Theme / Issue : Corresponding plan	Title of the measure concerned	Description	Period of performance	Performance monitoring system – reports to provide	Performance indicators	Corrective measures	Responsible managers for implementation	
<p>Communication</p> <p>Ensure a harmonious implementation of the work at all stages of its performance with all the communities directly or indirectly impacted by the project</p> <p>Communication plan</p>	SE-Mit-3- Complaint management and internal support for relocation.	An outcome of the RAP, complaint management is the attentive listening to the affected populations regarding relocation. It must be effective and transparent in order to take into consideration and share all the grievances expressed by the communities in order to define appropriate communication and support strategies.	The complaint management plan covers the entire project: from the implementation of the resettlement plan and throughout the period of adaptation of the displaced communities.	To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly Quarterly reports to be submitted by the Relocation Committee until full adaptation of resettled population	- Number of registered complaints and reports on actions taken for complaint management.	Ensure that all registered complaints have been satisfactorily treated. If not, complaints not yet treated will have to appear positively handled in following report.	- Relocation committee appointed by the Executive Committee of the Rodrigues Regional Assembly - Airport of Rodrigues - Spokesperson of the village of Sainte Marie - Fishing station managers and livestock breeder users of the impacted area - Villagers of Plaine Corail (proposed resettlement location)	
	SE-Mit-5- Communication plan concerning the integration of external workers.	The project will bring in foreign and specifically qualified labour. It is important to communicate about a considerable and temporary advent of an external population and to ensure transparency concerning the hiring procedures in relation to foreign workers.	This communication plan must begin prior to the arrival of the first workers and continue throughout all of the works phase.	To be monitored by: RRA / ARL Annual reports submitted by the Airport of Rodrigues in collaboration with Rodrigues Regional Assembly that include communication measures taken on the period as well as local surveys on inhabitants as well as external workers.	- Number of communication activities carried out; - Number of communication media produced and distributed; - Number of organized sessions, meetings or information workshops; - Results of carried out surveys; - Number and qualitative details on hired people; - Number of registered complaints and reports on actions taken for complaints management.	- Organise additional communication activities in case of insufficient communication and if required through surveys results. - Ensure that all registered complaints have been satisfactorily treated. If not, complaints not yet treated will have to appear positively handled in following report.	- Executive Committee of the RRA - Airport of Rodrigues - Village committees of the airport area (Anse Quitor and Plaine Corail – Cascade Jean Louis) - Local media (radio)	
	SE-Mit-7- Communication and hiring management plan	Specific communication concerning hiring procedures should be put in place so that impacted communities are informed about job opportunities and other related information.	This communication plan must begin and continue throughout the works phase.					
	SE-Mit-11- Community consultation plan for monitoring the evolution of the agro-pastoral system. SE-Mit-12- Support measures concerning livestock breeding techniques.	These measures relate to the communication procedures to be employed concerning the specific and important subject of adaptation of agricultural and livestock breeding techniques by all communities.	The measures occur from the resettlement of displaced villagers and continue throughout the period of community adaptation.					- Relocation committee appointed by the Executive Committee of the RRA - Rodrigues Agriculture Commission - Village Committee (Plaine Corail – Cascade Jean Louis) and non-resident livestock breeders - Possibly a specialised external entity such as an NGO
	SE-Mit-13 - Support and fishermen's complaint management plan.	These measures relate to the communication procedures to be undertaken with the fishermen's community following relocation.	The measures occur from the resettlement of displaced villagers and continue throughout the period of community adaptation.		To be monitored by: RRA and the Resettlement Monitoring Committee of Rodrigues Regional Assembly (with the help of an external specialized entity) Bi-annual Relocation Plan Report to be submitted by the Relocation Committee including complaints management and satisfaction surveys.	- Number of registered complaints and reports on actions taken for complaint management, - Qualitative evaluation according to survey results.	- Improve communication with local people according to reports' feedback. - Ensure that all registered complaints have been satisfactorily treated. If not, complaints not yet treated will have to appear positively handled in following report.	- Relocation committee appointed by the Executive Committee of the RRA - Rodrigues fishing Commission - Fishing station managers - Airport of Rodrigues
	SE-Mit-14- Plan for consultation and support of the communities of the area concerning the development of income-generating activities. SE-Mit-15- Economic support plan for households.	These measures relate to the communication procedures to be employed with the village communities in the area in order to promote the development of income-generating activities for households by becoming aware of the initiatives that the villages and villagers would like to implement.	These measures are developed from the resettlement of displaced villagers and continue throughout the period of community adaptation.					- Rodrigues women and small entrepreneurship Commission - Rodrigues Agriculture Commission - Rodrigues fishing Commission - Airport of Rodrigues - Village committees of the airport area (Anse Quitor, Plaine Corail – Cascade Jean Louis)

Theme / Issue : Corresponding plan	Title of the measure concerned	Description	Period of performance	Performance monitoring system – reports to provide	Performance indicators	Corrective measures	Responsible managers for implementation
Complaint management Ensure that all complaints from communities or individuals affected by the implementation of the project are received, reviewed and that appropriate action is taken within a reasonable time to arrive at a mutually acceptable solution. Complaints management plan	SE-Mit-3- Complaint management and internal support for relocation.	The relocation complaint management process requires careful listening to affected populations. It must be effective and transparent in order to take into consideration and share all the grievances expressed by the communities in order to define appropriate communication and support strategies.	<i>(entire project)</i>	To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly Relocation Plan Report including complaint management to be submitted by the Relocation Committee at the end of the relocation plan and before resettlement.	- Number of complaints issued; - Number of complaints satisfactorily resolved.	- Ensure that all registered complaints have been satisfactorily treated. If not, complaints not well treated will have to appear positively handled before works begin.	- Relocation committee appointed by and in liaison with the Executive Committee of the RRA - Airport of Rodrigues - Spokesperson of the village of Sainte Marie - Fishing station managers and livestock breeder users of the impacted area - Villagers of Plaine Corail (proposed resettlement location)
	SE-Mit-11- Community consultation plan for monitoring the evolution of the agro-pastoral system.	This measure is the implementation of an effective and transparent complaint management mechanism concerning agriculture and livestock breeding. This mechanism makes it possible to become aware of the potential discontent of individuals or communities concerning the evolutionary process of the agro-pastoral system.	The measures occur from the resettlement of displaced villagers and continue throughout the period of community adaptation.	To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly (with the help of an external specialized entity) Bi-annual Relocation Plan Report to be submitted by the Relocation Committee including complaint management and satisfaction surveys.	- Number of registered complaints and reports on actions taken for complaints management, - Qualitative evaluation according to survey results.	- Improve communication with local people according to reports' feedback. - Ensure that all registered complaints have been satisfactorily treated. If not, complaints not yet treated will have to appear positively handled in following report.	- Relocation committee appointed by the Executive Committee of the Rodrigues Regional Assembly - Rodrigues Agriculture Commission - Villagers and livestock breeders of the resettlement area
	SE-Mit-13 – Support and fishermen's complaint management plan.	This plan must implement a complaint management mechanism issued by the fishermen's community following relocation.	The measures occur from the resettlement of displaced villagers and continue throughout the period of community adaptation.	To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly (with the help of an external specialized entity) Bi-annual Relocation Plan Report to be submitted by the Relocation Committee including complaint management and satisfaction surveys.	- Number of registered complaints and reports on actions taken for complaints management, - Qualitative evaluation according to survey results.	- Improve communication with local people according to reports' feedback. - Ensure that all registered complaints have been satisfactorily treated. If not, complaints not yet treated will have to appear positively handled in following report.	- Relocation committee appointed by the Executive Committee of the Rodrigues Regional Assembly - Rodrigues fishing Commission - Relocated fishing post managers
Resettlement and compensation The set of measures to be taken for the resettlement and compensation of impacted communities must help to limit the socio-economic impacts resulting from the displacement of populations by restoring livelihoods and the standard of living of displaced people. Action plan for relocation and compensation (including the livelihood restoration plan)	SE-Mit-14- Plan for consultation and support of the communities of the area concerning the development of income-generating activities.	The goal of this measure is to keep communities on a viable and sustainable socio-economic dynamic by proposing to families that they diversify their economic activities.	This follow-up takes place from the construction phase and continues during the period of adaptation of the displaced communities.	To be monitored by RRA Annual report submitted by the Small Entrepreneurship Commission of Rodrigues Regional Assembly to Airport of Rodrigues and Rodrigues Regional Assembly Executive Committee.	- Quantitative and qualitative evaluation of local development according to survey results. - Number of local set up small activities and businesses.	- Enhance local economic environment through group consultations with specific and relevant themes according to evaluation results.	- Relocation committee appointed by and in liaison with the Executive Committee of the RRA - Rodrigues women and small entrepreneurship Commission - Rodrigues Agriculture Commission - Rodrigues fishing Commission - Airport of Rodrigues - Village committees of the airport area (Anse Quito, Plaine Corail – Cascade Jean Louis)
Community development Medium-term planning of actions that should	SE-Mit-9- Agricultural technical support plan.	This measure contributes to the consolidation of integration in the community environment through the support of technical services	These measures occur from the resettlement of displaced villagers and continue	To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly (with	- Number of projects implemented; - Number of direct and indirect beneficiaries;	Projects reinforcement or implementation according to results obtained from	- Relocation committee appointed by and in liaison with the Executive Committee of the RRA

Theme / Issue : Corresponding plan	Title of the measure concerned	Description	Period of performance	Performance monitoring system – reports to provide	Performance indicators	Corrective measures	Responsible managers for implementation
<p>be implemented to achieve socio-economic development goals at the local level to trigger a virtuous process of improving living conditions</p> <p>Community development plan</p>		facilitating the adaptation of agricultural models and thereby promoting the viability of production.	throughout the period of community adaptation.	the help of an external specialized entity) Annual report submitted by the Commission of Agriculture dealing with results obtained from field surveys and farmer consultations.	<ul style="list-style-type: none"> - Geographical coverage of the projects implemented; - Diversity of topics discussed. 	field surveys and farmer consultations.	<ul style="list-style-type: none"> - Rodrigues Agriculture Commission - Village committees of the airport area (Anse Quito, Plaine Corail – Cascade Jean Louis)
	<p>SE-Mit-11- Community consultation plan for monitoring the evolution of the agro-pastoral system. SE-Mit-12- Support plan concerning livestock breeding techniques.</p>	These measures contribute to consolidating the integration of communities through the support of technical services facilitating the adaptation of farming methods to the new environment and thereby promoting the viability of production.	The measures occur from the resettlement of displaced villagers and continue throughout the period of community adaptation.				<ul style="list-style-type: none"> - Relocation committee appointed by and in liaison with the Executive Committee of the RRA - Rodrigues Agriculture Commission - Livestock breeders of the relocation area - Village committees of the airport area (Anse Quito, Plaine Corail – Cascade Jean Louis)
	<p>SE-Mit-14- Plan for consultation and support of the communities of the area concerning the development of income-generating activities.</p>	The goal of this measure is to keep communities on a viable and sustainable socio-economic dynamic by proposing to families that they diversify their economic activities.	This follow-up takes place from the construction phase and continues during the period of adaptation of the displaced communities.	To be monitored by RRA Annual report submitted by the Small Entrepreneurship Commission of Rodrigues Regional Assembly to Airport of Rodrigues and Rodrigues Regional Assembly Executive Committee.			<ul style="list-style-type: none"> - Enhance local economic environment through group consultations with specific and relevant themes according to evaluation results.
<p>Workforce and training Encouragement to form a more rigorous workforce to improve the skills of local labour leading to economic growth linked to the creation of local jobs.</p> <p>Workforce management and training plan</p>	<p>SE-Mit-5- Communication plan concerning the integration of external workers.</p>	These measures for the development of a management policy concerning the accommodation of external workers permit the improvement of incomes in the locations.	This measure must take place throughout the construction phase.	To be monitored by: RRA / ARL Annual reports submitted by the Airport of Rodrigues in collaboration with Rodrigues Regional Assembly that include communication measures taken on the period as well as local surveys on inhabitants as well as external workers.	<ul style="list-style-type: none"> - Number of communication activities carried out; - Number of communication media produced and distributed; - Number of organized sessions, meetings or information workshops; - Results of carried out surveys; - Number and qualitative details on hired people; - Number of registered complaints and reports on actions taken for complaints management, - Qualitative evaluation according to survey results. 	<ul style="list-style-type: none"> - Organise additional communication activities in case of insufficient communication and if required through survey results. - Ensure that all registered complaints have been satisfactorily treated. If not, complaints not yet treated will have to appear positively handled in following report. 	<ul style="list-style-type: none"> - ARL - Project managers - Rodrigues labour Commission - Executive Committee of the RRA - Airport of Rodrigues - Village committees of the airport area (Anse Quito, Plaine Corail – Cascade Jean Louis) - Local media (radio)
	<p>SE-Mit-7- Communication and hiring management plan</p>	This measure is to showcase local skills, job opportunities and associated hiring conditions, and to foster local hiring to provide opportunities to obtain skills. This measure is to implement a worker complaint management process including the development of a labour law awareness and training program.	This measure must take place throughout the construction phase.				<ul style="list-style-type: none"> - ARL - Project managers - Executive Committee of the RRA - Rodrigues labour Commission - Village committees of the airport area (Anse Quito and Plaine Corail – Cascade Jean Louis) - Local media (radio)

Table 139: Overall Social Management Plan for operational phase

10.2.2 Social Management Plans to be implemented for the operational phase

This SMP is accompanied by monitoring and evaluation tools that are required to monitor the performance and assess its accuracy.

The different plans proposed in this document are explained and a general "framework" is given for their development. The SMP alone cannot suffice, and each of the tools must be subject to development work.

It is proposed that the Social Management Plan of the Project of expansion of the runway of Plaine Corail Airport be structured and articulated according to the following plans:

- Communication plan
- Complaint management plan
- Community assistance and communication plan for the development of income generating activities
- Community development plan
- Public health and community safety plan
- Workforce management and training plan.

10.2.2.1 Communication plan

10.2.2.1.1 Management issues

In order to maintain good relations with all the stakeholders affected by the project and to promote a harmonious integration of the project in the environment, it is essential to establish operational channels and strategies for communication enabling an ongoing dialogue and information flow between the project's developers and the affected communities.

10.2.2.1.2 Impact study recommendations

The social impact study emphasizes a number of avenues of action to stabilize and improve the communication loop between the project and the communities, and to establish a specific mechanism to:

- Organize information meetings at the level of the towns affected by the project (to be incorporated into mitigation plans SE-Mit-3, SE-Mit-5, SE-Mit-7, SE-Mit-11, SE-Mit-12, SE-Mit-13, SE-Mit-14, SE-Mit-15);
- Use an effective and transparent complaint management mechanism at project level and communicate this mechanism to the towns impacted by the project activities (integrated into mitigation measures SE-Mit-3, SE-Mit-11 and SE-Mit-13);
- Develop and adopt a continuous and transparent communication strategy concerning the issues of displacement and relocation (the various mitigation plans take into consideration communication concerning issues related to the habitat, the various sectors of activity such as agriculture, livestock and fisheries, employment, health and safety. These communication measures are implemented at the beginning of the project, during the construction phase, and maintained for certain measures – measures SE-Mit-3, SE-Mit-11, SE-Mit-13, SE-Mit-14 and SE-Mit-15 - in the operating phase);
- Communicate transparently about the procedures for direct and indirect hiring of the project (opportunities, skills and education levels required – mitigation measures SE-Mit-5, SE-Mit-7);

- Establish a framework for consultation with regular meetings (local authorities, communities, airport, Rodrigues government) to address public development initiatives (notably through measures SE-Mit-7, SE-Mit-14, SE-Mit-15).

10.2.2.1.3 Objectives

The guidelines of the communication plan to be established are intended to ensure a smooth implementation of the work at all stages of its performance.

10.2.2.1.4 Performance indicators

The performance indicators to be taken into consideration in the communication plan are:

- The number of communication activities carried out;
- The number of communication media items produced and distributed;
- The number of organized sessions, meetings or information workshops;
- The number of information activities organized.

10.2.2.1.5 Management strategy

A communication plan will be prepared and put in place. A community relations officer will be appointed.

The information should be communicated on a regular basis in an understandable and accessible way to stakeholders. The communication strategy should be tailored to the linguistic preferences of the affected communities, their decision-making process and the needs of vulnerable or disadvantaged groups.

The communication plan includes the following elements:

- Identification of stakeholders: i.e. each group or person affected and/or concerned by the work;
- Choice of the appropriate mechanisms for communicating and disseminating information, which may include individual meetings, design, at the organisational level, of the role of a community liaison officer, the use of local media, etc;
- Elaboration of a timetable for the implementation of the communication and dissemination of information in relation to the planned activities and according to the target audiences.
- Identification of the necessary resources and responsibilities of each stakeholder.

10.2.2.1.6 Follow-up

It is essential to establish a follow-up process to ensure that the actions of the plan are actually put in place.

10.2.2.1.7 Reports

The contents of the reports prepared must show:

- A communication and information dissemination plan;
- A report of each of the meetings and communication actions organized;
- Quarterly and annual reports from the project holder, taking stock of the activities carried out.

10.2.2.2 Complaints management plan

10.2.2.2.1 Management issues

In order to establish and maintain a good relationship with the surrounding communities during the implementation of the project, the Developer must permit these communities to share their views, interests and concerns concerning the work to be done.

10.2.2.2.2 Impact study recommendations

For a social impact study, the recommendations for structuring a complaint management plan are to:

- Establish a complaint management mechanism that is widely known to local stakeholders (local authorities and populations affected directly or indirectly by the project) and works in an efficient and transparent manner (to be integrated specifically in the plans for mitigation measures SE-Mit-3, SE-Mit-11 and SE-Mit-13);
- Use an effective and transparent complaint management mechanism at project level and communicate this mechanism to the authorities and towns impacted by the project activities

10.2.2.2.3 Objectives

The main objective of a complaint management plan is to ensure that all complaints from communities or individuals affected by the implementation of the project are received, reviewed and that appropriate action is taken within a reasonable period to arrive at a mutually acceptable solution.

10.2.2.2.4 Performance indicators

The performance indicators to be taken into consideration during the communication plan are the:

- Number of complaints issued per month;
- Number of complaints per month satisfactorily resolved.

10.2.2.2.5 Management strategies

The complaint management strategy is based on the following principles:

- the procedure for making a complaint and to whom it should be made must be transparent and presented to communities according to their language preference. This procedure should be widely disseminated to the communities that could potentially be affected by the implementation of the project. The communication can be made verbally and/or in writing;
- the channels of communication between the parties must remain open until the situation is resolved to the satisfaction of both parties;
- all claims or complaints from the communities and the reactions or responses proposed must be described and classified in a register.

Community or individual claims will be subject to the following procedure:

- Receipt: the claims received verbally or in writing by the project managers are directed within 24 hours of receipt to a single point of contact;
- Preliminary assessment: when the claim is urgent and requires immediate response, and the community relations officer cannot respond to it, it shall be communicated promptly to a manager appointed by the project;

- Registration: the person in charge of the community relations registers all the claims and the correspondence and actions taken on this subject;
- Transmission: If the complaint cannot be resolved on the spot, the community relations officer informs his supervisor within the project management to immediately initiate a resolution process;
- Acknowledgement of receipt: the community relations officer shall send a written reply to the requestor within 48 hours to acknowledge receipt of the claim. The letter provides detailed information about the complaint itself (subject, explanation, people concerned, etc.) and the steps that will be taken and the estimated time to resolve the claim. The content of the correspondence is also verbally addressed to ensure that the members of the affected community have a good understanding;
- Evaluation meeting: if necessary, a meeting is organized with the person/group who has filed the claim to discuss and try to clarify and resolve the matter;
- Conflict resolution meeting: If the issue is not resolved to the satisfaction of all parties at the evaluation meeting, a more expanded meeting is organized, involving other institutions that can act as mediators in the resolution of the dispute (specialised commissions);
- Meeting of the administrative authorities: If the matter is still unresolved, another expanded meeting comprising the participation of the administrative authorities (Regional Assembly) is organised;
- Legal action: as a last resort, a lawsuit could be brought by the parties concerned, after all other possible avenues of dispute resolution have been exhausted.

10.2.2.2.6 Follow-up

In order to ensure proper monitoring of a complaint management plan, it is necessary to:

- Maintain a register and ensure that all complaints have been addressed;
- Ensure that investigations are completed within seven days of receipt of a complaint.
- Ensure that complaints are processed and resolved within one month of receipt.

10.2.2.2.7 Reports

The contents of the reports prepared must show:

- A complaint registration form containing at least the following pieces of information:
 - unique file number;
 - time and date of receipt of the complaint;
 - nature and description of the complaint;
 - means of communication (telephone, letter, visit, verbal communication);
 - person in charge of the case;
 - name, address, contact details and signature of the complainant;
 - name, address, contact information and signature of the witness(es);
 - follow-up and investigation carried out after the complaint was lodged;
 - actions undertaken and signature of the person having examined the complaint;
 - agreement leading to the closure of the file (including the complainant's signature).
- Monthly reports from the community relations officer reporting the number of complaints and the status of the conflict resolution process.

10.2.2.3 Community assistance and communication plan for the development of income generating activities

10.2.2.3.1 Impact study recommendations

For a social impact study, the recommendations for the implementation of an action plan for relocations and compensations are to:

- Develop a Livelihood Restoration Plan for communities that will be affected by "economic displacement" (loss of property and/or livelihoods) and establish a monitoring-assessment program of the socio-economic conditions of displaced people;
- Support the diversification of income-generating economic activities in the context of the Livelihood Restoration Plan so that people affected by the project can regain sustainable livelihoods and possibly invest in these activities a part of the financial indemnifications resulting from the RAP (SE-Mit-14);
- Support projects for the development of income-generating activities aimed at internally displaced people, in particular people displaced due to economic reasons (measure SE-Mit-14).

10.2.2.3.2 Performance indicators

The performance indicators to be taken into consideration during the action plan for relocations and compensations are:

- Compensations that meet at least the international requirements (IFC standards) on the basis of a price matrix to be established in the framework RAP;
- Results of a questionnaire on the satisfaction rate of displaced and/or compensated people.

10.2.2.3.3 Follow-up

A monitoring and evaluation procedure should permit:

- The monitoring of the execution of compensation and relocation process (verification of the level of execution and its quality);
- The monitoring of the impacts of the PARC (verifying the achievement of objectives and redefining them when necessary).

10.2.2.3.4 Reports

The reports to be edited to facilitate the follow-up of the process established are:

- Evaluation monitoring reports.

It should be noted that relocation provisions of the populations affected by the project have already been undertaken by the Rodrigues authorities through the Executive Committee of the Rodrigues Regional Assembly which has specifically established a Relocation Committee with the objective of preparing, organising and implementing the RAP of the communities identified as directly impacted by the project. As all the actions already undertaken follow in part the international standards mentioned above, the challenge is then to verify that the procedures undertaken are consistent with the requirements.

10.2.2.4 Community development plan

10.2.2.4.1 Management issues

Measures to support the reconstitution of an economic and productive situation favourable to the families affected by the project, both in the area directly impacted and in the areas proposed as relocation areas, must be planned and implemented.

10.2.2.4.2 Impact study recommendations

Recommendations for the implementation of community development support measures are to:

- Promote local economic development initiatives to accompany the people and communities affected by the project (specifically for measure SE-Mit-14);
- Reinforce or create income-generating activities, in particular those carried out by women (measure SE-Mit-14);
- Develop programs to support economic diversification and the development of income-generating activities (e.g. crafts, trade, services and processing of agricultural and fishery products) (measure SE-Mit-14);
- Develop programs to support agricultural and agro-pastoral development in order to make the best use of the territory's resources and adapt land uses (measures SE-Mit-9, SE-Mit-11 and SE-Mit-12);
- Support livestock breeding by allowing for the creation of water points and creating fodder perimeters for livestock (measure SE-Mit-12);
- Improve access to water in proposed areas such as the resettlement areas (measures SE-Mit-9 and SE-Mit-12).

10.2.2.4.3 Objectives

The CDP is to be constructed with the communities and aims to plan in the medium term the actions that should be implemented to achieve socio-economic development goals at the local level. It is intended to trigger a virtuous process of improving living conditions in the host communities of internally displaced people, benefiting resettled families and host families equally.

10.2.2.4.4 Performance indicators

Indicators that can highlight the performance of the community development plan are:

- The number of projects implemented within the framework of the CDP;
- The number of direct and indirect beneficiaries of projects implemented within the framework of the CDP;
- The scope of projects implemented within the framework of the CDP;
- Geographical coverage of projects implemented within the framework of the CDP;
- The diversity of the topics addressed by the projects implemented within the framework of the CDP (health, education, access to water, transport, agriculture, livestock, fisheries, market gardening, economic diversification, income-generating activities...).

10.2.2.4.5 Management strategy

The CDP should be developed and implemented on the basis of the following aspects:

- The methods of project selection and allocation of budgets: the choice of projects must be based on a participatory approach, in particular in terms of prioritisation.
- Implementation methods: the realisation of tenders, the selection of contractors, of partners for implementation and of control officers must be controlled by the local administrative Entities as much as possible and be monitored by the populations.
- The monitoring and control methods: communities must be equipped with tools and means to ensure that the projects are properly implemented, in articulation and with the support of the administrative authorities and the committees that provide control over the assignment and execution of projects. The monitoring of the execution must be based on simple and measurable performance indicators.
- The system of communication and transparency: the most complete and broadest communication is the first safeguard against misuse of funds. It also makes it possible to obtain a broad membership of the people in the project.
- Monitoring and assessment of impacts: in the same way as monitoring of implementation must be carried out, monitoring to measure achievement of objectives

and effectiveness of actions is necessary. The local authorities, through the specific established committee bringing together those responsible for the various themes involved, must be able to carry out the monitoring of the impacts. A budget must be allocated to it and it must allow for a regular period to carry out an external audit.

10.2.2.4.6 Reports

The reports to be drafted to facilitate the follow-up of the community development plan to be implemented are:

- CDP strategy and guidance documents;
- Implementation reports of projects funded in the context of the CDP;
- Annual reports of implementation of the CDP.

10.2.2.5 Workforce management and training plan

10.2.2.5.1 Management issues

The project must establish and encourage rigorous workforce management that maximizes local economic benefits without compromising the quality of the work.

The project will generate temporary jobs during the construction phase. A preference for the assignment of jobs should be directed towards the citizens of Rodrigues and especially the citizens of the communities close to the airport area.

10.2.2.5.2 Impact study recommendations

Recommendations for the implementation of a workforce management and training plan are to:

- Develop and implement a workforce management plan that includes:
- a description of working conditions and hiring conditions (measure SE-Mit-7);
- a management and quality policy concerning the accommodation of external workers (measure SE-Mit-5);
- Ensure the implementation of a recruitment policy favouring local citizens with the goal of prioritizing the resettled people of the project and the affected local communities (measure SE-Mit-7);
- Prepare a training program for employees and a training plan for communities in collaboration with regional administrative authorities;
- Carry out an inventory of local skills within the framework of the training and skill-building action plan in order to prioritise the employment of those directly affected by the project (measure SE-Mit-7);

10.2.2.5.3 Objectives

The main objectives in a workforce management and training plan are to:

- Establish and maintain a good working relationship between the project, its partners, subcontractors and workers;
- Promote equal opportunities and equitable treatment of workers;
- Encourage the economic growth of the region of implementation of the project by creating local jobs.

10.2.2.5.4 Performance indicators

In order to measure the performance of the workforce management plan and the training established, consideration should be given to:

- The number of complaints issued or non-conformities identified;
- The number of satisfactory settlements within one month.

10.2.2.5.5 Management strategies

The strategies to be established for the workforce and training management plan concern:

- A hiring policy: with equal skills, all recruitments will respect the order of priority in order to encourage job creation within the populations directly affected by the project;
- Hiring procedures: in addition to be posted in the project information office, labour needs will be disseminated in nearby towns;
- Working conditions and terms of employment: the project and the selected contractors will provide in writing an employment contract to all employees. This contract will include the terms and conditions of work: remuneration, hours of work, overtime, holidays and sick leave, etc;
- Representation of workers and grievance management: according to the national labour code.
- Training: all project staff, including those working for contractors, subcontractors and suppliers, must have the necessary skills and must be aware of the risks associated with their work, their responsibilities for managing these risks and the plans, procedures or instructions that must be followed in relation to the management of these risks.
- Subcontractors: all requirements of the GSP and all operational controls developed under the management system will also apply to all contractors and subcontractors responsible for the design, construction, operation or closure of the project. By extension, these requirements will also be applied to suppliers of goods and services to the project.

10.2.2.5.6 Follow-up

To ensure the monitoring the workforce management plan and training, it is necessary to:

- Regularly check the number of local jobs created in the project activities in the mining, road and port areas using indicators;
- Check the complaints register regularly, to ensure that actions have been taken to resolve the various cases.

10.2.2.5.7 Reports

Reports on the workforce and training management plan will be required to document monthly complaints, grievances, strikes, etc. and the measures put in place to resolve disputes.

10.2.3 Summary of plans to be drawn up for social management during the the operational phase

Table 140: Summary of Social Management Plans for operational phase

Plan	Measures that the plan must allow to implement and monitor (see description in section 7 and ESMP above)	Person in charge of implementation and control
Communication plan	SE-Mit-3 SE-Mit-5 SE-Mit-7 SE-Mit-11 SE-Mit-12 SE-Mit-13 SE-Mit-14 SE-Mit-15	<ul style="list-style-type: none"> - Executive Committee of the RRA - Relocation committee appointed by the Executive Committee of the Rodrigues Regional Assembly - ARL - Spokesperson of the village of Sainte Marie - Fishing station managers and livestock breeder users of the impacted area - Rodrigues Agriculture Commission - Rodrigues women and small entrepreneurship Commission - Rodrigues fishing Commission - Villagers of Plaine Corail (proposed resettlement location) - Village committees of the airport area (Anse Quitor and Plaine Corail – Cascade Jean Louis) - Local media (radio) - Possibly a specialised external entity such as an NGO <p>To be monitored by: ARL/ RRA and the Resettlement Monitoring Committee of Rodrigues Regional Assembly (with the help of an external specialized entity)</p>
Complaints management plan	SE-Mit-3 SE-Mit-11 SE-Mit-13	<ul style="list-style-type: none"> - Relocation committee appointed by and in liaison with the Executive Committee of the RRA - ARL - Spokesperson of the village of Sainte Marie - Fishing station managers and livestock breeder users of the impacted area

Plan	Measures that the plan must allow to implement and monitor (see description in section 7 and ESMP above)	Person in charge of implementation and control
		<ul style="list-style-type: none"> - Villagers of Plaine Corail (proposed resettlement location) - Relocation committee appointed by the Executive Committee of the Rodrigues Regional Assembly - Rodrigues Agriculture Commission - Villagers and livestock breeders of the resettlement area - Rodrigues fishing Commission - Relocated fishing post managers <p>To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly (with the help of an external specialized entity)</p>
<p style="text-align: center;">Community assistance and communication plan for the development of income generating activities</p>	<p>SE-Mit-14</p>	<ul style="list-style-type: none"> - Relocation committee appointed by and in liaison with the Executive Committee of the RRA - Rodrigues women and small entrepreneurship Commission - Rodrigues Agriculture Commission - Rodrigues fishing Commission - ARL - Village committees of the airport area (Anse Quito, Plaine Corail – Cascade Jean Louis) <p>To be monitored by RRA</p>
<p style="text-align: center;">Community development plan</p>	<p>SE-Mit-9 SE-Mit-11 SE-Mit-12 SE-Mit-14</p>	<ul style="list-style-type: none"> - Relocation committee appointed by and in liaison with the Executive Committee of the RRA - Rodrigues Agriculture Commission - Livestock breeders of the relocation area - Village committees of the airport area (Anse Quito, Plaine Corail – Cascade Jean Louis) - Rodrigues fishing Commission - Rodrigues women and small entrepreneurship Commission

Plan	Measures that the plan must allow to implement and monitor (see description in section 7 and ESMP above)	Person in charge of implementation and control
		To be monitored by: Resettlement Monitoring Committee of Rodrigues Regional Assembly (with the help of an external specialized entity)
<p align="center">Workforce management and training plan</p>	<p>SE-Mit-5 SE-Mit-7</p>	<ul style="list-style-type: none"> - ARL - Project managers - Rodrigues labour Commission - Executive Committee of the RRA - Village committees of the airport area (Anse Quitar, Plaine Corail – Cascade Jean Louis) - Local media (radio) <p>To be monitored by: RRA / ARL</p>

11 Cumulative Impact Assessment

11.1 Introduction

At this stage, the Cumulative Impact Assessment is only outlined and is of generic nature, based on bibliographic review and initial assessment from the ESIA undertaken and will be further assessed as part of the final ESIA based on the updated project information and strategic development plan for Rodrigues, currently being finalized .

It is proposed to use IFC's 'Good Practice Handbook - Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets' for the preparation of a Cumulative Impact Assessment.

Cumulative impacts are those that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to in this document as "developments") when added to other existing, planned, and/or reasonably anticipated future ones. For practical reasons, the identification and management of cumulative impacts are limited to those effects generally recognized as important on the basis of scientific concerns and/or concerns of affected communities.

Multiple and successive environmental and social impacts from existing developments, combined with the potential incremental impacts resulting from proposed and/or anticipated future developments, may result in significant cumulative impacts that would not be expected in the case of a stand-alone development.

The expected outcomes of a good Cumulative Impact Assessment can be summarized as follows:

- Identification of all Valued Environmental and Social Components (VEC) that may be affected by the development under evaluation.
- In consultation with stakeholders, agreement on the selected VECs the assessment will focus on.
- Identification of all other existing and reasonably anticipated and/or planned and potentially induced developments, as well as natural environmental and external social drivers that could affect the selected VECs.
- Assessment and/or estimation of the future condition of selected VECs, as the result of the cumulative impacts that the development is expected to have, when combined with those of other reasonably predictable developments as well as those from natural environmental and external social drivers.
- Evaluation of the future condition of the VECs relative to established or estimated thresholds of VEC condition or to comparable benchmarks.
- Avoidance and minimization, in accordance with the mitigation hierarchy, of the development's impact on the VECs for the life of the development or for as long as the impacts continue to be present.
- Monitoring and management of risks to VEC viability or sustainability over the life span of either the development or its effects, whichever lasts longer.

- Provision of project-related monitoring data to governments and other stakeholders for the life of the development, and material support for the development of collaborative regional monitoring and resource management initiatives.
- Continuous engagement and participation of the affected communities in the decision-making process, VEC selection, impact identification and mitigation, and monitoring and supervision

11.2 Identification of Valued Environmental and Social Components

Valued environmental and Social components (VECs) are defined as fundamental elements of the physical, biological or socio-economic environment, including the air, water, soil, terrain, vegetation, wildlife, fish, birds and land use that may be affected by a proposed project.

The Draft ESIA has identified the preliminary VECs of concern both during construction and operation phases, as listed below. The final VECs will be assessed further during the finalization of the ESIA based on the revised designs and upon comprehensive consultation with stakeholders.

- Physical Environment (section 6.3)
 - Terrestrial geology and geotechnics
 - Marine and shores geology and marine turbidity
 - Hydrology
 - Hydrogeology
 - Water resource and waste water management
- Biological Environment (section 6.4)
 - Terrestrial Biological Environment
 - Marine Biological Environment
- Utility and Services (section 6.5)
 - Transport network
 - Electricity supply
 - Water supply
 - Wastewater management
 - Solid waste management
- Socio-Economic Environment (section 6.6)
 - Land Use Planning
 - Housing
 - Heritage Conservation
 - Education, Health and Community Facilities
 - Employment Uses
 - Agriculture and Fisheries
 - Mineral Resources
 - Tourism
- Air quality and noise (section 6.7)
- Heritage and Landscape (section 6.8)

11.3 Spatial and Temporal Boundaries

11.3.1 Spatial Boundary

Given the site of the island, it is estimated that the whole island should be taken into account for utilities & services and Socio-economic environment

Physical and Biological Environment are more of a regional scale

11.3.2 Temporal Boundary

The temporal boundary is set by the foreseen phased approach of the airport expansion and the increase in flight rotations with time

The project is expected to bring a significant boost to the air connectivity of the island, while creating new opportunities for business and tourism in Rodrigues Boosting the Economic Development of Rodrigues

Boosting the Economic Development of Rodrigues has an overall positive impact

11.4 Assessing Cumulative Impacts on VECs

The cumulative and indirect impact study will have to take into account all the variables that could be impacted by the increase in the volume of passengers transported to the island. In particular, it will be necessary to evaluate:

11.4.1 With regard to the increase in tourist flows

- The current capacity of tourist reception (number and typology of reception structures: accommodation, catering, transport, services to tourism: leisure, sports, cultural tours, etc.)
- The economic contribution of tourism through the circuit of reception structures (accommodation, catering, etc.)
- The number of employments in the sector (by sub-sector of activities)
- Evaluation of the needs arising from the increase in demand

11.4.2 About the possible demographic evolutions

- Migration to Rodrigues of economic operators (which also includes the resettlement or return of Rodrigues inhabitants settled in Mauritius or abroad)

11.4.3 Assessment of the increase in pressure on the island's resources and services

- Assessment of the current state of service provision and evaluation of possible scenarios of increased demand, with respect to:
 - Water supply
 - Food supply, especially for local production (fishing, breeding, market gardening)
 - Transportation
 - Solid and liquid waste management
 - Health

11.4.4 Assessment of the possible increase in pressure on critical habitat

- Assessment of the increase in pressure on critical habitats due to change in land use
- Assessment of the increase in pressure on marine and terrestrial habitats, primarily associated with the tourism industry

11.4.5 Evaluation of the institutional framework and the capacities of the regional administration to respond to the increase in demand for goods and services resulting from the increase in flows to the island.

The study of the policy orientations of the regional administration in the areas of tourism, housing, environment and basic services will be included.

The study should also take stock of other major projects underway or in the planning phase in Rodrigues and identify the cumulative effects of the various projects. An inventory of major infrastructure and service strengthening projects is to be drawn up.

The study will be based on available data and on the collection of primary data from economic operators and service delivery structures. The databases produced in 2019 during the first study will serve as the basis for the work.

A management plan for the cumulative and indirect impacts of the project will be produced and will contain recommendations on the measures to be adopted to enhance the positive impacts and mitigate the negative impacts.

11.5 Assessing the Carrying Capacity of the Island

As part of the CIA study the carrying capacity of the island will be determined based on the available information from the KPMG-Deloitte report and the updated Rodrigues Development Plan. The ESIA will further assess the potential impacts of the VEC over a set time period and will identify any short comings and provide potential mitigation measures to improve sustainability and prevent degradation.

From a Tourism point of view, the carrying capacity of a destination determines the ideal number of international arrivals that can visit at the same time without causing destruction of local resources. It is not a static number, but rather can fluctuate over time based on the destination's ability to handle visitors – for instance, whether or not there is sufficient waste management infrastructure in place. The goal of this type of study is to create balance and a sustainable tourism industry – i.e. determine how to generate economic growth while ensuring environmental protection, a quality visitor experience, and the well-being of local residents.

12 Estimated costs of the environmental management

12.1 Environment measures costs

The following table presents a cost estimate of the various environmental measures and management and monitoring plans previously presented.

Those costs are not to be considered as a project commitment, they are just indicative and will have to be revised afterwards.

Geotechnical measures are not estimated here as they will have to be sized and included within the work cost.

12.1.1 Construction phase

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
Works facilities, buildings and plants	Works-ins	Works facilities management plan and associated monitoring	Management and monitoring plans preparation, implementation and control	To be implemented by the Contractor Under ARL's control	500 000	considering a person dedicating 5 days a week to this task throughout the duration of the work (to be parted between contractor and ARL)
	Site and works facilities management and monitoring plan					
Marine environment including marine works monitoring (Marine environment monitoring plan)	Phy-Mar-Mit-1	Control of backfilling processes	Measurement campaign of turbidity and current	External consultancy engineering Under ARL's control	30000 + 10000/month	Transport: 30000 €. Installation of measure devices (buoy), measurement, and analysis: 10000 € per month.
	Marine environment monitoring plan for current and turbidity					
	Phy-Mar-Mit-2	Optimisation of the location of discharges	Specific hydrodynamic survey	External consultancy engineering Under ARL's control	60000	To limit the plume extent by choosing a sheltered release location.
	Phy-Mar-Av-3	Optimisation of the discharges timetable to avoid times when currents reverse and/or already turbid condition				To limit the plume extent by releasing at the appropriate time (weak current, initial low level of suspended particulate matter).
	Phy-Mar-Mit-4	Silt curtain around discharges	Placed around the discharge locations during the working phase.	Contractor Under ARL's control	15000	To contain suspended sediments and to prevent sediment dispersal.
	Phy-Mar-Mit-5	Silt curtain around dredging area	Placed around the excavation site during the dredging phase.	Contractor Under ARL's control	15000	To contain suspended sediments and to prevent sediment dispersal.

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
Hydrology - Stormwater management Wastewater management / Water resource and water supply	Phy-Hyd-Mit-1	Temporary sedimentation ponds	-	To be implemented by the Contractor Under RRA and ARL's control	-	Included in construction costs
	Phy-Wat-Mit-1	Install a desalination plant to supply drinking water to the workers' camp	Specific desalination skid for the workers' site facilities and construction facilities during the construction phase	To be implemented by the Contractor Under RRA and ARL's control	200 000 €	Estimated cost for a 60 m ³ /d desalination plant
	Phy-Wat-Comp-2	Temporary or permanent replacement of current Caverne Bouteille plant supply by seawater and plant upgrading in order to enable it to treat sea water In case of no possible upgrading, a new mobile treatment plant would be necessary	Research for a new catchment site with construction of a structure and installation of pumps Caverne Bouteille existing plant upgrading	To be implemented by the Contractor Under RRA and ARL's control	Upgrading and new pumping system: to be sized and estimated by contractor In case of a new mobile treatment plant: 1,5 M€	Relocation in the sea or in Plaine Caverne area out of the zone of influence <i>30 000 €/month in a leasing solution is chosen</i>
	Phy-Wat-Av-3	Works wastewater treatment plant	Wastewater treatment skid of adequate capacity for both the airport facilities and for the workers' site facilities during the construction phase	To be implemented by the Contractor Under RRA and ARL's control	700 000 €	For 400 workers, and 100 l/d
	Surface stormwater run-off, drinking and wastewater management and monitoring plan		Controls and analysis	To be implemented by the Contractor Under RRA and ARL's control	67 000€/year	Basic monitoring tasks & survey = 12,000 €/y Specific O&M tasks on the Treatment Plants: - Sewage Treatment Plant (50 m ³ /d) = 90 € / day, i.e. around 25,000 € per year.

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
						- Drinking Water Treatment Plant (60 m3/d) = 110 €/day, i.e. around 30,000 € per year.
	Phy-Wat-Av/Mit-4	Preventive measures to reduce risks during the construction phase - Risk management plan	-	To be implemented by the Contractor Under ARL's control	-	Included in construction costs
Karst	Phy-Kar-Mit-1	Reduce speed of trucks' movement to an acceptable level	-	To be implemented by the Contractor Under ARL's control	-	Included in construction costs
	Phy-Kar-Mit-2	Reduce rotations between the embankment site and material storage site Carry out and document baseline observations at potentially exposed buildings to check on the presence of cracks ahead of works	-		-	Included in construction costs
	Phy-Kar-Mit-3	Reuse of materials from cutting to embankment areas	-		-	Included in construction costs
	Phy-Kar-Mit-4	Reuse of topsoil materials after works phase	-		-	Included in construction costs
	Phy-Kar-Mit-5	Infilling of local erosion features and use of drainage system to manage rainwater responsible for local erosion	-	To be implemented by the Contractor Under RRA and ARL's control	-	Included in construction costs

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
	Phy-Kar-Mit-6	Open blasting and site excavation works to be done during dry season	-	To be implemented by the Contractor Under ARL's control	-	Included in construction costs
	Phy-Kar-Mit-7	Reduce unit's explosive charge decreasing noise impact	-	To be implemented by the Contractor Under RRA and ARL's control	-	Included in construction costs
	Phy-Kar-Mit-8	Concentrate open blasting operations in a short amount of time	-	To be implemented by the Contractor Under ARL's control	-	Included in construction costs
	Phy-Kar-Mit-9	Work only during the day and inform local authorities and communities about the health and safety plan applicable on work site	-		-	Included in construction costs
	Phy-Kar-Mit-10	Avoid running excavator's engines in case of no use	-		-	Included in construction costs
	Phy-Kar-Mit-11	Chose the closest extraction site for fill material / Forbid the export of cuttings	-		-	Included in construction costs
	Phy-Kar-Mit/Av-12	Define a restricted area around the caverns with no heavy vehicles allowed to access it	-		-	Included in construction costs
	Phy-Kar-Mit-13	Reduce trucks' movement's speed to an acceptable level to minimize the induced vibrations	-		-	Included in construction costs

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
	Phy-Kar-Av-14	Adapt and reduce trucks' movements and rotations between embankment filling site and material storage site	-		-	Included in construction costs
	Phy-Kar-Av-15	Restrict traffic in close vicinity of the caves	-		-	Included in construction costs
	Phy-Kar-Av-16	Installation of a protective formwork to ensure protection and controlled access by airport authorities	-		-	Included in exploitation costs
	Phy-Kar-Comp-17	Remove the remaining fossiliferous sediments from all threatened caves		External specialist Under ARL's control	30000	<i>To be precisely estimated</i> Estimation including 15 days of an external specialist, and 15 days of 2 helpers, and transport costs
	Phy-Kar-Av/Mit-18	Daily maintenance and inspection of excavators	-	To be implemented by the Contractor Under RRA and ARL's control	-	Included in construction costs
	Phy-Kar-Av/Mit-19	No maintenance and refuelling on the construction site (or with specific waterproof delimited zone)	-	To be implemented by the Contractor	-	Included in construction costs
	Phy-Kar-Mit-20	Establishment of a storage site for earthwork wastes, close to the project site, in order to reduce pollution induced by traffic from storage activity	-	Under ARL's control	-	Included in construction costs

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
	Phy-Kar-Av-21	Proceed to an impact assessment of the extraction site and have the material origin validate prior the works phase	-		20000	ESIA cost if new extraction site
	Karst monitoring plan		Observation well implantation In conjunction with geotechnical investigation work	To be implemented by the Contractor Under RRA and ARL's control	100000	Installation of minimum 10 observation wells (depending on the result of the geotechnical campaign)
			Groundwater Monitoring campaign Groundwater monitoring program during works and operation		25000	Monthly sampling of at least 10 wells during works

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
			Caves monitoring: visual inspection, 3 sismometers per cavity (in 3 caves)		15000	Visual inspection (250€/visit + expenses) = 5000 9 sismometers = 10000
Biodiversity	BioT-Av-1	Avoid remarkable trees located at the edge of the project Targeted species: <i>Antirhea bifurcata</i> , <i>Elaeodendron orientale</i> , <i>Fernelia buxifolia</i> , <i>Hyophorbe verschaffeltii</i> , <i>Terminalia bentzoe subsp. rodriguesensis</i>	These 19 trees must be marked prior to the works phase with permanent devices (fences, ribbons, paintings) and tagged with an identification number (ID) in order to be properly followed during the works phase	External biodiversity specialists / RRA services Under RRA and ARL's control	4 500 €	- Tree marking and identification 2500,00 - Monitoring for 5 years 2000,00
	BioT-Av-2	Moving the control tower out of the nature reserve	The official boundaries of the nature reserve will be provided by the forestry services	External biodiversity specialists / RRA services Under RRA and ARL's control	None	

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
	BioT-Mit-3	Creating an arboretum of endemic species inside the airport landscaping	A partnership with the Forestry Services or the Mauritius Wildlife Fondation will be conducted in order to produce seedlings of native species from seeds, cuttings or juveniles collected from the nature reserves of Rodrigues and/or Mauritius. Collection of plant material will be authorized in advance by the reserve managers in any case. A specific protocol will be designed for tree transplantation.	External biodiversity specialists / Contractor Under ARL's control	12 500€	- Collection of plant material (seeds, cuttings..) 2500,00 - Nursing (production of plants) 4000,00 - Planting 4000,00 - Monitoring for 5 years 2000,00
	BioT-Mit-4	Transplant remarkable trees and ferns intended to be cut down during the works phase	A competent and trained external coordinator on the transplantation protocol will be mobilized	External biodiversity specialists / RRA services Under RRA and ARL's control	25 000€	For 20 trees: 20 x 2,500€
	BioT-Mit-5	Genetic conservation of populations of impacted rare species : production and reintroduction of clones and genetic ancestors of these species	A partnership with the Forestry Services or the Mauritius Wildlife Fondation will be conducted in order to produce seedlings of native species from seeds, cuttings or juveniles collected from the specimen located within the project footprint.	External biodiversity specialists / RRA services Under RRA and ARL's control	11 000€	- Collection of plant material (seeds, cuttings..) 3 000,00 - Nursing (production of plants) 3 000,00 - Planting 2 000,00 - Monitoring for 5 years 3 000,00
	BioT-Comp-6	Action plan towards more sustainable agricultural practices for native biodiversity.	This action plan can be approached by: 1- the inventory and consultation of all agricultural	External biodiversity specialists / RRA services	Approximately 35 000€	

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
			and ecologist partners throughout the project; 2- the establishment of the development challenges of livestock breeding in Rodrigues; 3- drawing up an inventory of actions that can improve the quality and productivity of livestock farming by promoting local biodiversity; 4- proposing a fine cartographic work accompanied by spatialized actions throughout the Rodrigues territory	Under RRA and ARL's control		
	BioT-Comp-7	Ecological restauration within the limits of the Anse Quitor nature reserve	<ul style="list-style-type: none"> - Check the watering quality of the plants; - Identify, locate and count exotic species and define appropriate control methods against invasive and potentially invasive exotic species; - Quantify the mortality rate and health status of native species. - Establish corrective measures if necessary, in order to always orientate this rehabilitation project in an ecologically correct direction. 	<p>External biodiversity specialists / RRA services</p> <p>Under RRA and ARL's control</p>	100 000€	<ul style="list-style-type: none"> - Harvesting from wild specimens and arboretums 3000,00 - Production of 500 individuals 10000,00 - Planting 4000,00 - New fence within the shared limits between the airport and the nature reserve (1,2 km approximately): 80 000,00

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
	BioT-Mit-8	Collect arthropods from the Tropiphodora genus before and during earthwork	Learn how to distinguish the two different species recorded on site	External biodiversity specialists / Contractor Under ARL's control	Approximately 10 days of sampling effort at 500€ per day 5 000€	
	Biodiversity management and monitoring plan		The only costs non included in the above lines is ARL's management	-	-	Included in conception costs
	BioM-Mit-1	Installation of a floating boom to confine sediments and prevent their resuspension in the marine environment	-	Contractor Under ARL's control	-	Included in construction costs
	BioM-Mit-2	Monitoring for the possible presence of turtles in the project area and egg laying site on Crab Island	-	Shoals Rodrigues / SEMPA Under ARL's control	-	Included in the monitoring plan costs (see further)
	BioM-Av-3	Avoid coral heads located at the edge of the project	-	Contractor Under ARL's control	-	Included in conception costs
	Marine environment monitoring plan	Coral Reef Protection and monitoring	Ecological diagnostic and assessment	Shoals Rodrigues / SEMPA + Contractor Under ARL's control	50 000	Cost of a marine specialist (1000 /day + expenses) 1 visit / month during 1,5 year
Marine environment management and monitoring during the works		Ensure that the major environmental issues in the project area are preserved (coral reef at Pointe Palmiste and marine turtles)				
Infrastructures and solid waste management	Inf-Mit-1	Transfer materials out of high traffic periods	-	To be implemented by the Contractor	-	Included in construction costs
	Inf-Mit-2	Anticipate and supervise exceptional convoys	-		-	Included in construction costs
	Inf-Mit-3	Rehabilitate roads that were used during	-	Under ARL's control	-	Included in construction costs

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
		construction and at the end of works				
	Inf-Mit-4	Adapt the period of work	-		-	Included in construction costs
	Inf-Mit-5	Use generators	-		-	Included in construction costs
	Inf-Mit-6	Recycling and reuse materials	-		-	Included in construction costs
Air quality	Air-Mit-1	Institute a speed limit on all unpaved roads around the site (max 30 km/h)	-	To be implemented by the Contractor	-	Included in construction costs
	Air-Mit-2	Regularly water the main roads and areas producing dust	-		-	Included in construction costs
	Air-Mit-3	Limit the storage and handling of materials that may create dust	-		-	Included in construction costs
	Air-Mit-4	Reduce road traffic to a minimum by optimizing the truck loading for the site supply	-	Under ARL's control	-	Included in construction costs
	Air-Mit-5	Minimize on-site travel distances and avoid as much as possible traffic close to inhabited areas	-		-	Included in construction costs
	Air quality and noise environment management and monitoring plan		Air and noise monitoring		To be implemented by the Contractor	20000 per month if permanent monitoring
Noise	Noi-Mit-1	Avoid night work and limit work during evening period	-	To be implemented by the Contractor	-	Included in construction costs
	Noi-Mit-2	Choose the least noisy techniques and equipments	-	Under ARL's control	-	Included in construction costs

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
Landscape	Land-Mit-1	Limit the vegetation clearing area during construction	-	Contractor Under ARL's control	included in construction costs	-
	Land-Mit-2	Prevent encroachment of areas outside designated boundaries	-	Contractor Under ARL's control	included in construction costs	-
	Land-Mit-3	Minimize the lighting of construction sites	-	Contractor Under ARL's control	included in construction costs	-
	Land-Mit-4	Minimize visual intrusion	-	Detail Design Engineer and Architects ARL Contractor Under ARL's control	6000	-
	Land-Mit-5	Ensure that platforms and construction work areas are maintained in a clean and orderly manner	-	Contractor Under ARL's control	included in construction costs	-
	Land-Mit-6	Perform temporary seeding	-	Detail Design Engineer and Architects ARL Contractor Under ARL's control	included in construction costs	-
	Land-Mit-7	Temporary fences and earthworks will be arranged to reduce visual intrusion	-	To be implemented by the Contractor Under ARL's control	included in construction costs	-
	Land-Mit-8	Ensure that earth and material storage areas are not located directly on the coast	-	Detail Design Engineer and Architects ARL	included in construction costs	-

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
	Land-Mit-9	Plantings are designed and arranged to form visual screens to mitigate visual impacts	-	Contractor Under ARL's control	4 000 000	-
	Land-Mit-10	Rehabilitate areas that were temporarily used during construction.	-		included in construction costs	-
	Land-Mit-11	Favor dispersed relocation building in existing communities	-	RRA	-	-
	Land-Mit-12	Relocate families outside of the Zone of Visual Influence	-	Under RRA and ARL's control	-	-
	Land-Mit-13	Community support in construction process	-		-	-
	Land-Mit-14	Establishment of an Airport Urban Development Master Plan to monitor and frame urban development related to airport activity and ensure sustainable good living conditions	-	RRA Under RRA and ARL's control	50000	-
	Land-Mit-15	Airport buildings and infrastructures to reach architectural quality and soundness	-	Detail Design Engineer and Architects ARL Under ARL's control	0 to 20 % extra construction cost	-
	Land-Mit-16	Touristic infrastructure to respect the scale of Rodrigues' landscape and sense of place	-	RRA	-	-
	Land-Mit-17	Urban development to foster the development of	-	Under RRA and ARL's control	-	-

Theme / Issue	Title and ID of the measure / Plan		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
		public places and public amenities				
	Land-Mit-18	Establishment of local Urban Development Master Plan to monitor urban development related to tourism growth, to value and enhance the local landscape	-		30 000€ to 80 000€ for each of the 12 public beaches and other locations identified in the PASIDS tourism master plan	-
	Landscape management and monitoring plan				-	Included in the project's costs

Table 141: ESMP Cost Estimate Construction Phase - Environmental Aspects



12.1.2 Operation phase

Theme / Issue	Title and ID of the measure		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
Marine environment	Phy-Mar-Mit-6	Prevent spills and accidents : train staff to avoidance of spills.	-	ARL	-	Included in construction and exploitation costs
	Phy-Mar-Mit-7	Implementing methodologies for quick confining and treatment of pollutants and protocol for depollution in case of spill	-	ARL	-	Included in construction and exploitation costs
Hydrology - Stormwater management Waste water management / Water resource and water supply	Phy-Hyd-Mit-5	Treat chronic or accidental sources of pollution	-	ARL	-	Included in construction and exploitation costs
	Phy-Hyd-Mit-2	Stormwater network	Water treatment plant within an integrated water management plan for the airport facilities at operational phase	To be implemented by the Detail Design Engineer Under ARL's control	1,75 M	All included: Water treatment plant, buffer storage pond for stormwater, storage capacities for rainwater, industrial water, drinking water before distribution, connecting pipelines and discharge lines at sea, ancillaries including building, access roads
	Phy-Hyd-Mit-3	Stormwater ditch located to restore the watershed boundary				
	Phy-Hyd-Mit-4	Climate change adaptation: buffering storage and works facilitating infiltration				
	Phy-Hyd-Mit-6	Vegetation of slopes and ditches and collection of infrastructure runoff				
	Phy-Wat-Av-6	Integrated water management plan				
	Phy-Wat-Mit-7	Water treatment plant				
	Phy-Wat-Mit-8	Reuse water plan				

Theme / Issue	Title and ID of the measure		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
	Surface stormwater run-off, drinking and wastewater management and monitoring plan		Operation Monitoring	ARL (or external specialist engineer under ARL and RRA's control)	67 000€/year	<p>Basic monitoring tasks & survey = 12,000 €/y</p> <p>Specific O&M tasks on the Treatment Plants:</p> <ul style="list-style-type: none"> - Sewage Treatment Plant (50 m³/d) = 90 € / day, i.e. around 25,000 € per year. - Drinking Water Treatment Plant (60 m³/d) = 110 €/day, i.e. around 30,000 € per year.
Karst	Phy-Kar-Av-22	Supplementary geotechnical and geophysical investigations to characterize the karstic network (caves and voids)	-	To be implemented by ARL or an external specialist Contractor (as part of the 10-year guarantee)	-	-
	Phy-Kar-Mit/Comp-23	In situ investigation diagnostic of infilled cavities (televisual cavity inspections)	-		-	-
	Phy-Kar-Mit/Comp-24	Additional laboratory testings (Aggregate testings) to characterize the erosive potential of in situ geological formations	-	Under ARL's control	-	-

Theme / Issue	Title and ID of the measure		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
	Phy-Kar-Av-25	All operations involving hydrocarbons must comply with current standards to prevent spills and, if necessary, implement emergency measures	-	ARL	-	Included in exploitation costs
	Phy-Kar-Mit-26	Do not allow groundwater use downstream of airport infrastructure	-	To be implemented by the Detail Design Engineer Under ARL's control	-	Included in construction costs
	Karst monitoring plan		Groundwater monitoring program during operation	To be implemented by ARL or an external specialist Under ARL's control	25000/year	Monthly sampling
			Post-commissioning caves monitoring	To be implemented by ARL or an external specialist Contractor (as part of the 10-year guarantee) Under ARL's control	5000	
Infrastructures and solid waste management	Inf-Mit-7	Restore road connections	-	To be implemented by the Detail Design Engineer and Contractor (as part of the 10-year guarantee) Under RRA and ARL's control	-	Included in construction costs
Air quality	Air-Mit-6	If possible, limit the taxiing distance	-	To be implemented by ARL or external specialist engineer	-	Included in exploitation costs

Theme / Issue	Title and ID of the measure		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
	Air-Mit-7	Opt for technologies that limit aircraft pollutant emissions during taxiing	-	Under ARL and RRA's control	-	Included in exploitation costs
	Air-Mit-8	Encourage pilots to shut down unneeded engines when taxiing	-		-	Included in exploitation costs
	Air-Mit-9	Limit congestion (aircraft queues) by making departures as fluid as possible	-		-	Included in exploitation costs
	Air-Mit-10	Minimize the use of the APU and GPU	-		-	Included in exploitation costs
	Air-Mit-11	Develop and implement procedures to limit the use of the thrust reverser	-		-	Included in exploitation costs
	Air-Mit-12	Make ecological performance a criterion of choice for service vehicles and ground equipment	-	To be implemented by the Detail Design Engineer	-	Included in exploitation costs
	Air-Mit-13	Develop an efficient public transport system to limit the use of private vehicles	-	Under ARL's control	-	Included in exploitation costs
	Air quality and noise environment management and monitoring plan		-	To be implemented by ARL or external specialist engineer	60000 per year (2 campaigns)	Included in exploitation costs
Noise	Noi-Mit-3	Limit air traffic at night and the use of noisy equipment	-	To be implemented by ARL or external specialist engineer	-	Included in exploitation costs
	Noi-Mit-4	Raise the ILS glide slope to reduce noise emissions during landing	-	Under ARL and RRA's control	-	Included in exploitation costs

Theme / Issue	Title and ID of the measure		Implementation	Responsible for management and implementation	Estimated costs (EUR)	Comments
	Noi-Mit-5	Adapt departure procedures to minimize noise exposure on the ground during take-off	-	To be implemented by the Detail Design Engineer Under ARL's control	-	Included in exploitation costs
	Noi-Mit-6	Limit the use of reverse thrust	-		-	Included in exploitation costs
	Noi-Mit-7	Develop an efficient public transport system to limit the use of private vehicles	-		-	Included in exploitation costs
Landscape	Land-Mit-19	Set up of green and blue grids	Environment study to carry out and measures to implement	RRA	-	-
	Land-Mit-20	Set up of sustainable and resilient city guidelines and architectural guidelines	-	RRA	50000	-
	Land-Mit-21	Investment in woodland planting to feed the timber industry	-	RRA	(supported by private sector)	-
	Land-Mit-22	Set up sustainable timber management plan	-	RRA	-	-
	Land-Mit-23	Ravine preservation and sanctuarisation of associated woodlands	-	RRA	Fencing cost (eg, 220 000€ for Anse Quitar) + fence and site maintenance	-

Table 142: ESMP Cost Estimate Operation Phase - Environmental Aspects



12.2 Social measures costs

The following table deals with a cost estimation of the various social plans previously presented. Those costs are not to be considered as a project commitment, they are just indicative and will have to be revised afterwards.

It should be noted that the below estimated costs take into account some costs exclusively concerning the Resettlement Plan (RAP) which has already been undertaken by the Rodrigues authorities through the Executive Committee of the Rodrigues Regional Assembly which has specifically established a Relocation Committee with the objective of preparing, organising and implementing the RAP of the communities identified as directly impacted by the project. Those estimated costs are mentioned in brackets in the table below.

#	Mitigation measures / Plan	Implementation	Responsible	Estimated costs (EUR)	Comments
SE-Comp-1	Resettlement Action Plan	Regular community consultations, household census and inventories, crop and livestock inventories, fisherman and breeder consultations and inventories, land and cadastral surveys, house buildings...	Rodrigues Regional Assembly Resettlement Committee	(1000000)	As it has been noticed in this report, the resettlement action plan has already been initiated by the Rodrigues Regional Assembly who specifically created a Resettlement Committee for the relocation plan. All direct induced costs will be borne by the Rodrigues Regional Assembly.
SE-Comp-2	Ensuring agricultural lands provision	Land and cadastral surveys, villager (moved and hosts) consultations, access facilitation to farming materials, financial support for fencing.	Rodrigues Regional Assembly Resettlement Committee	(30000)	The costs will be integrated into the Resettlement Action Plan. No land will be bought as lands already belong to the State and are allocated through lease agreement.
SE-Mit-3	Communication, grievance management and support plan after resettlement	Regular community consultations, creation of a complaint bureau, appointment of a dedicated officer (key contact)	Rodrigues Regional Assembly Resettlement Committee / ARL	18000	Budget of EUR 6000 per year for 3 years.
SE-Comp-4	Ensuring grazing lands and fishing posts provision	Land and cadastral surveys, fisherman, breeder and villager (moved and hosts) consultations, financial	Rodrigues Regional Assembly Resettlement Committee	(125000)	The costs will be integrated into the Resettlement Action Plan. No land will be bought as lands already belong to the

#	Mitigation measures / Plan	Implementation	Responsible	Estimated costs (EUR)	Comments
		support for fencing (if penned livestock)			State and are allocated through lease agreement.
SE-Mit-5	Communication plan for external workers integration	Communication releases using radio and newspaper, creation of a communication access point, regular consultations with local communities and external workers	ARL / Rodrigues Regional Assembly / Promoters	15000	Budget of EUR 7500 per year for 2 years.
SE-Mit-6	Management plan for influx	Survey on accommodation accessibility, communication releases using radio and newspaper, assistance for housing renovation	ARL / Rodrigues Regional Assembly / Promoters	100000	Financial support may be necessary for villagers to renovate available rooms to welcome people.
SE-Mit-7	Communication plan and recruitment management	Communication releases using radio and newspaper, creation of a specific bureau of recruitment and dedicated staff	ARL / Promoters	150000	Budget of EUR 25000 + 5000 + 20000 = EUR 50000 per year for 3 years.
SE-Mit-8	Communication plan and grievance management about recruitment	Community regular consultations, creation of a complaints bureau, appointment of a dedicated staff	ARL / Promoters	15000	The complaint bureau depends on the recruitment office specifically created. Additional budget may be EUR 5000 per year for 3 years

#	Mitigation measures / Plan	Implementation	Responsible	Estimated costs (EUR)	Comments
SE-Mit-9	Assistance plan on agricultural techniques	Appointment of a dedicated office and extension officer, regular consultations to farmers, training sessions for extension officers for natural agriculture implementation	Rodrigues Regional Assembly (through Commission of Agriculture)	30000	Budget of EUR 7000 + 1500 + 1500 per year for 3 years
SE-Mit-10	Resettlement Action Plan follow up	Regular community consultations, complaint management bureau	ARL / Rodrigues Regional Assembly Resettlement Committee		The costs may be integrated into the Resettlement Action Plan and will be upon the third mitigation measure's budget of EUR 6000 per year for 3 years.
SE-Mit-11	Communities consultation plan and follow-up on agro-pastoralism evolution	Appointment of a dedicated office and extension officer, regular consultations with farmers, training sessions for extension officers for farming and livestock breeding implementation	Rodrigues Regional Assembly (through Commission of Agriculture)	15000	Budget estimated may be integrated into the one allocated for the assistance plan on agricultural techniques. Can be considered an additional cost of EUR 5000 per year.
SE-Mit-12	Assistance plan on livestock farming techniques	Appointment of a dedicated office and extension officer, regular consultations with farmers, training	Rodrigues Regional Assembly (through Commission of Agriculture)		

#	Mitigation measures / Plan	Implementation	Responsible	Estimated costs (EUR)	Comments
		sessions for extension officers for livestock breeding implementation			
SE-Mit-13	Communication plan and grievance management of fishermen	Regular fishermen community consultations, creation of a complaint bureau, appointment of a dedicated staff for fisheries	ARL / Rodrigues Regional Assembly (through Commission of Fisheries)	15000	The complaint bureau may depend on an office of the Commission of fisheries. A budget may be EUR 5000 per year for 3 years
SE-Mit-14	Community assistance and communication plan for the development of income generating activities	Regular local community consultations and meetings, appointment of a local development bureau and a dedicated staff for assistance, training sessions for successful entrepreneurship	ARL / Rodrigues Regional Assembly (through the Commission of Small Entrepreneurship)	30000	Budget of EUR 7000 + 1500 + 1500 per year for 3 years
SE-Mit-15	Households economic assistance plan	Appointment of a local development bureau and a dedicated staff for assistance, training sessions for successful entrepreneurship	ARL / Rodrigues Regional Assembly (through the Commission of Small Entrepreneurship)		
SE-Mit-16	Communication plan on road safety	Road safety survey for adequate road safety measures implementation, regular	ARL / Promoters	22500	Budget of EUR 7500 per year for 3 years.

#	Mitigation measures / Plan	Implementation	Responsible	Estimated costs (EUR)	Comments
		communication release using radio and newspaper, meeting with communities			
SE-Mit-17	Pedestrian security and road signaling management plan	Road safety survey for adequate road safety measures implementation, road safety measures set up.	ARL / Promoters / Rodrigues Regional Assembly	250000	
SE-Mit-18	Health and Safety training coordination plan with promoters	Appointment of a health and safety department, set up of health and safety training sessions, regular consultations with project workers and surrounding communities	ARL / Promoters	120000	Budget of EUR 10000 + 30000 per year for 3 years
SE-Mit-19	Community communication plan about the project security measures	Regular consultations and meeting with project surrounding communities	ARL / Promoters		

Table 143: ESMP Cost Estimate Construction Phase - Social Aspects

13 References

13.1 Physical environment

13.1.1 Climate and meteorological conditions

13.1.1.1 Current

- Schott, F. A., S.-P. Xie, and J. P. McCreary Jr. (2009), Indian Ocean circulation and climate variability, *Rev. Geophys.*, 47, RG1002, doi:10.1029/2007RG000245.
- Assessment of the wave potential at selected hydrology and coastal environments around a tropical island, case study: Mauritius. Available from: https://www.researchgate.net/publication/322591524_Assessment_of_the_wave_potential_at_selected_hydrology_and_coastal_environments_around_a_tropical_island_case_study_Mauritius
- Wolanski et al., 1993; Kraines et al., 1998, 1999; 31 Tartinville and Rancher, 2000; Andréfouët et al., 2001; Kench and McLean, 2004; Angwenyi and Rydberg, 32 2005; Hench et al., 2008; Lowe et al., 2009; Taebi et al., 2011; Hoeke et al., 2013; Chevalier et al., 2014, 2015
- World Risk Report 2022; Bündnis Entwicklung HilftRuhr University Bochum – Institute for International Law of Peace and Armed Conflict (IFHV); 2022

13.1.1.2 Wave

- Shoreline Change Detection Modelling for Le Morne Coast of Mauritius, Chapter VI, p. 118-158

13.1.1.3 Water level

- (Lynch et al. 2002)
- UNECO, Sea Level Measurement and Analysis in the Western Indian Ocean, National Report, Mauritius
- R. LOWRY ET AL., 2008, Observations of Seiching and Tides Around the Islands of Mauritius and Rodrigues, 28p.
- ASCLME 2012. National Marine Ecosystem Diagnostic Analysis. Mauritius. Contribution to the Agulhas and Somali Current Large Marine Ecosystems Project (supported by UNDP with GEF grant financing). Unpublished report.
- Acclimate project, 2011, Indian Ocean Commission (COI)
- Ministry of Environment, Sustainable Development, and Disaster and Beach Management – TNC Report 2016
- Tropical cyclones
- D.P. Callaghan et al., 2005, Atoll lagoon flushing forced by waves, / *Coastal Engineering* 53 (2006) 691–704
- IBTrACS - International Best Track Archive for Climate Stewardship, version 4, website: <https://www.ncdc.noaa.gov/ibtracs/>

13.1.2 Geology and geotechnics

- Stratagem974 (2018). New runway – Sir Gaëtan Duval Airport, Plaine Corail Geophysical survey, Rodrigues Island (February 2018), 45p.
- GIBB (Mauritius) Ltd (2018). Extension of Runway at Plaine Corail Airport – Rodrigues Geotechnical Interpretative Report (September 2018), 119p.

- Water Research Co Limited (2018). Factual Report - Geotechnical investigation for Extension of Runway at Sir Gaetan Duval Airport – Phase B (April 2018), 365p.

13.1.3 Marine and shores geology and marine turbidity

13.1.3.1 Marine shores geology

- COPPEJANS E. and al., The Marine Green and Brown Algae of Rodrigues (Mauritius, Indian Ocean°, Journal of Natural History, 2004, 38, 2959-3020, ISSN 0022-2933 print/ISSN 1464-5262 online 2004 Taylor & Francis Ltd
- Beach Erosion management in Small Island Developing States: Indian Ocean case studies, WIT Transactions on Ecology and the Environment, Vol 126, 2009, ISSN 1743-3541 (online)
- Final SIDPR, Rodrigues Regional Assembly, July 2009
- Ministry of Energy and Public Utilities, Hydrology Data Book 1999-2005, Chapter 7: Hydrology of Rodrigues and Agalega, Figure 7.3, p.7
- Ministry of Agriculture, Food Technology & Natural Resources – Republic of Mauritius, Management Plan for Crab Island. Development of a Management Plan for the Conservation and Management of Offshore Islets for the Republic of Mauritius. 2004, Available from: https://www.researchgate.net/publication/269929648_Management_Plan_for_Crab_Island_Development_of_a_Management_Plan_for_the_Conservation_and_Management_of_Offshore_Islets_for_the_Republic_of_Mauritius

The current compiled oceanographic data necessary to quantify the influence on the currents and sediment transport is summarized as follows:

- Bathymetry:
The large scale model bathymetry data would be forced from the General Bathymetric Chart of the Oceans (GEBCO) with 0.5° resolution, approximately 430m.
- Closer to Rodrigues, the GEBCO bathymetry would be supplemented by a thinner data set close to the coast and inside the lagoon. Discussions are underway with the Hydrographic Section of the Ministry of Housing and Land of Mauritius to obtain accurate data both inside and outside the lagoon.
- Shoreline:
The shoreline was defined using data obtained from the Database of Global Administrative Areas (GADM) with approximately a 30 m resolution and re-delineated if necessary.
- Hurricane tracks:
The tracks of the Indian Ocean Hurricane were downloaded from the Joint Typhoon Warning Center (JTWC) website from 1986 to 2016. Trajectories are defined by 6 hour elapsed time points defined by its localization, intensity, maximum wind speed, and minimum SLP.
- Sea level:
Port Mathurin's tide gauge is part of the Global Sea Level Observing System (GLOSS). Controlled sea level data are checked and processed in order to establish sea level value more suitable for studies of long term sea-level change. Historical hourly level data are available in Rodrigues from 1986 to 2016.
- Tide Harmonic:
The LEGOS⁹ produced global finite element solutions (FES) tidal atlases computed from the tidal hydrodynamic equations and data assimilation. Harmonic constants, amplitude and phase, are extracted in the surrounding of the island.
- Coral Reef:

⁹ Laboratoire d'Etude en Géophysique et Océanographie spatiales

- Coral reef distribution around the island is extracted from the global distribution of coral reefs in tropical and subtropical regions, version 4.0 of November 2018. The dataset¹⁰ is compiled from various sources such as the UNEP World Conservation Monitoring Centre (UNEP-WCMC) and the WorldFish Centre, in collaboration with WRI (World Resources Institute) and TNC (The Nature Conservancy). The GIS layer has a consistent 30 m resolution and mostly originates from images acquired between 1999 and 2002.
- Climatology Statistics:
- An analysis was performed by MeteOcean to characterize the meteo-oceanic conditions in the vicinity of Rodrigues. Waves, winds, water height, salinity and temperature statistics are available at a deep water point (2989m from the MSL) located at -63°12'E 20°S, in the South of the island.

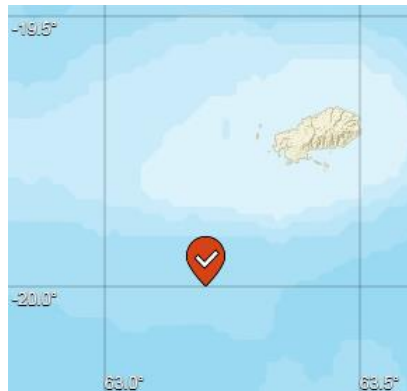


Figure 189: Location of the analysis point: -63°12'E,20°S (WGS84)

At the present time, some data are still being gathering, they will be taken into account in the next version of the report. This is the case of bathymetry and sediment characteristics (granulometry) data.

13.1.3.2 Seawater turbidity

- Final SIDPR, Rodrigues Regional Assembly, July 2009

13.1.4 Hydrology

- (M. Bakalowicz 2002)
- (Milanović, 2004)
- (Williams, 2008).
- (Evans, 2005
- (ADP, December 2000).

13.1.5 Hydrogeology

13.1.5.1 Ground water

The list of reviewed documents is shown below:

- Factual Report Geotechnical Investigation For Extension Of Runway At Sir Gaetan Duval Airport- Phase B April 2018 OPG 17067 ROD

¹⁰ UNEP-WCMC, WorldFish Centre, WRI, TNC (2018). Global distribution of coral reefs, compiled from multiple sources including the Millennium Coral Reef Mapping Project. Version 4.0, updated by UNEP-WCMC. Includes contributions from IMaRSUSF and IRD (2005), IMaRS-USF (2005) and Spalding et al. (2001). Cambridge (UK): UNEP World Conservation Monitoring Centre. URL: <http://data.unepwcmc.org/datasets/1>

- Factual Report Geotechnical Investigation For Extension Of Runway At Sir Gaetan Duval Airport- Phase C September 2018 OPG 17067 ROD
- Extension of Runway at Plaine Corail Airport Rodrigues Geotechnical Interpretative Report for preliminary design phase Report No: M019/031
- Stratigraphy and chronology of karst Features on Rodrigues island, southwestern Indian ocean Karst Geotechnical investigation
- Gregory J. Middleton and David A. Burney, May 2013. Rodrigues – An Indian Ocean Island Calcarene: Its History, Study and Management
- John Mylroie, Joan Mylroie and Greg Middleton. Rodrigues Island: carbonate deposition and karst processes as indicators of platform stability. Carbonates Evaporites, Springer.
- Feasibility study new runway at Sir Gaëtan Duval Airport, Rodrigues Final Report Ref. CCO 15 of 2010 Client: Rodrigues Regional Assembly Rotterdam/London/Mauritius, 28 October 2011
- KPMG 2009. Final SIDPR Sustainable Integrated Development Plan for Rodrigues “Plan de Développement Durable et Intégré de Rodrigues”. 453 p.

Other references:

- Petar T.Milanović, 2004. Water Resources Engineering In Karst. CRC Press LLC 340 p.
- M. Bakalowicz. Cours DEA HHGG Université Paris-6. Hydrogéologie karstique. Caractéristiques et concepts. Méthodes d'exploration, d'exploitation et de gestion active. Déc. 2002.
- Williams P.W. 2008. The role of the epikarst in karst and cave hydrogeology: a review. International Journal of Speleology, 37 (1), 1-10. Bologna (Italy)
- U.S. Environmental Protection Agency (EPA). 2002. Lexicon Of Cave And Karst Terminology With Special Reference To Environmental Karst Hydrology. 121 p.
- Evans, David; Henri Letient; and Aley, Thomas. 2005 Aquifer vulnerability mapping in karstic terrain Antamina Mine, Peru. Proc. Annual Mtng. Society for Mining, Metallurgy, and Exploration. 13p.
- Dörfliger, Nathalie & Jeannin, P.-Y & Zwahlen, F. (1999). Water vulnerability assessment in karst environments: A new method of defining protection areas using a multi-attribute approach and GIS tools (EPIK method). Environmental Geology. 39. 165-176
- Mylroie, Mylroie & Middleton 2016. Rodrigues Island: carbonate deposition and karst processes as indicator of platform stability. Carbonates and evaporites, 31(4): 421-435
- Société D'études Scientifiques des Cavernes de la Réunion, 1997. Expédition Rodrigues 97.Bulletin no 2. Numéro Spécial.
- L. Ferry, 1995. Hydroconsult International (GIE ORSTOM-EDF) Evaluation et Mise en Valeur Des Ressources en Eau ee L'île Rodrigues (projet FAO TPCIMARI4451)
- Virendra PROAG (date inconnue) La Distribution D'eau Potable à Maurice et à Rodrigues. Département de Génie Civil, Université de Maurice, Réduit, île Maurice. 16 p.
- JAN SVOMA and VLADIMIR HOUZIM, 1984. Protection of Groundwater from Oil Pollution in the Vicinity of Airports. Environ Geol Water Sci Vol 6, No 1, 21-30
- M.J. Lace and J.E. Mylroie (eds.), Coastal Karst Landforms, Coastal Research Library 5, DOI 10.1007/978-94-007-5016-6 4, © Springer ScienceCBusiness Media Dordrecht 2013
- Enrique Fernandez y Ramon Peiro, 1995. Introducción a la geología kárstica. Federación Española de Espeleología. 205 p.

13.1.5.2 Water quality, vulnerability and contamination

- GOD (Foster, 1987), DRASTIC (Aller et al., 1987), SINTACS (Civita and De Maio, 1997), EPIK (Doerfliger and Zwahlen, 1997), PI (Goldscheider et al., 2000), and COP, based on the European approach (COST, 2003), COPK (Daly et al., 2002; Zwahlen, 2003)
- Dörfliger, 1999
- KMPG (2009)
- (Source: UNDESA 29 June 2009)

13.1.6 Water resource and waste water management

13.2 Biological environment

13.2.1 Terrestrial biological environment

- (Rodrigues Ecosystem Profile - CEPF, 2014).
- [1] A. S. Cheke and L. Hume, *Lost Land of the Dodo. An Ecological History of Mauritius, Réunion & Rodrigues*, T&AD. Poys. London, 2008.
 - [2] S. Kirsakye, *La faune et la flore de Rodrigues*. Pailles, île Maurice: Mauritius Wildlife Foundation, 2015.
 - [3] G. P. Hempson, S. Archibald, W. J. Bond, R. P. Ellis, C. C. Grant, F. J. Kruger, L. M. Kruger, C. Moxley, N. Owen-Smith, M. J. S. Peel, I. P. J. Smit, and K. J. Vickers, "Ecology of grazing lawns in Africa," *Biol. Rev.*, vol. 90, no. 3, pp. 979–994, 2015.
 - [4] W. A. Strahm, *Plant Red Data Book for Rodrigues*. Mauritius: Koeltz Scientific Books, 1989.
 - [5] W. Strahm, "Rodrigues : can its flora be saved," *Oryx*, vol. 17, no. 3, pp. 122–125, 2017.
 - [6] J. R. Mauremootoo, J. R. Watt, and F. B. V. Florens, "State of the Hotspots - Mauritius Biodiversity," *Conserv. Int. State Hotspots*, p. 39, 2003.
 - [7] K. S. Walter and H. J. Gillett, "1997 IUCN Red List of Threatened Plants," *World*, p. 932, 1997.
 - [8] M. Rivers, K. Shaw, E. Beech, and M. Jones, *Conserving the World 's Most Threatened Trees A global survey of ex situ collections*. 2015.
 - [9] V. Tatayah, "Status of conservation of native medicinal plants of Mauritius and Rodrigues," *Asian Biotechnol. Dev. Rev.*, vol. 13, no. 3, pp. 85–108, 2011.
 - [10] IUCN (2019). The IUCN Red List of Threatened Species. Version 2019-1. <http://www.iucnredlist.org>. Downloaded on 21 March 2019.
 - [11] Johnson, D. 1998. *Hyophorbe verschaffeltii*. The IUCN Red List of Threatened Species 1998: e.T38582A10126752. <http://dx.doi.org/10.2305/IUCN.UK.1998.RLTS.T38582A10126752.en>. Downloaded on 18 June 2019.
 - [12] Strahm, W. 1998. *Polyscias rodriguesiana*. The IUCN Red List of Threatened Species 1998: e.T32503A9710314. <http://dx.doi.org/10.2305/IUCN.UK.1998.RLTS.T32503A9710314.en>. Downloaded on 18 June 2019.
 - [13] Mitchell, J. (1997). Mitigation in environmental assessment- furthering best practice. EA the Magazine of IEA and EARA, pp28-29.

- [14] Guidelines on Tree Transplanting, Greening, Landscape and Tree Management Section Development Bureau - The Government of the Hong Kong Special Administrative Region - September 2014

13.2.2 Marine biological environment

13.2.2.1 Marine natural context

- Indian Ocean Commission, 2013, Coral Reef Atlas part2, p182-200
- Pasnin O., Attwood C. and Klaus R., 2016. Marine systematic conservation planning for Rodrigues Island, western Indian Ocean. Ocean & Coastal Management Volume 130, October 2016, Pages 213-220.
- Robert P., 2014. Mission d'évaluation technique de l'île Rodrigues, République de Maurice. Commission de l'Océan Indien, 32p.

13.2.2.2 Marine habitats

- Chapman (2000) in Pasnin et al., 2016
- Schils T., Coppejeans E., Verbruggen H., De Clerck O., and Leliaert F, 2004. The marine flora of Rodrigues (Republic of Mauritius, Indian Ocean) (www.iucnredlist.org) (<http://doris.ffessm.fr>).
- Biotope, 2016. Projet d'extension de l'aéroport de Rodrigues (Maurice) réalisation d'un diagnostic écologique - PHASE 1 – Bibliographie. Agence française de développement, 98 p.
- Bouchon C., Mellinger J. and Bouchon-Navaro Yolande, 2015. Halophila stipulacea: une espèce invasive de Phanérogame marine dans les Antilles. UMR BOREA, DYNECAR, Labex CORAIL, Université des Antilles, 18p.
- Ahamada S., Bijoux J., Cauvin B., Hagan A., Harris A., Koonjul M., Meunier S., Quod J-P., 2008. Status of the Coral Reefs of the South-West Indian Ocean Island States: Comoros, Madagascar, Mauritius, Reunion, Seychelles.
- Fenner et al., 2004; Klaus et al., 2011b in Biotope 2016
- (Fenner et al., 2004; Klaus et al., 20011b; Hardman et al., 2016 in biotope, 2016).

13.2.2.3 Marine species

- (Klaus et al., 2011 in Biotope, 2016).
- (Hily et al., 2010)
- (Ahamada et al., 2008)
- Frétey T, Dupré A. and Dupré J., 2012. Tortues marines de Rodrigues Synthèse des connaissances et rapport de mission. Association Chélonée, 17 p.
- (<http://www.mmcs-ngo.org/en/marine-environment/cetaceans.aspx>)
- (www.fisheries.noaa.gov).

13.3 Social environment

- GARDELLA A. M.-A., 1979. The process of social formation on the island of Rodrigues (Indian Ocean). Department of Social Anthropology of London School of Economics and Political Science.
- HARDMAN E.R., EDWARDS A.J. and RAFFIN J.S.J., 2014. The seine-net fishery of Rodrigues Island, western Indian Ocean: is it sustainable or in terminal decline? Newcastle University.
- KAUSMAULLY Z. and CHINNEE D., 2018. Digest of statistics on Rodrigues 2017. Ministry of Finance and Economic Development of the Republic of Mauritius.



- YVERGNIAUX Y., 2013. Management of the octopus fishery in Rodrigues. Program for the implementation of a regional fisheries strategy for the Eastern and Southern Africa – Indian Ocean Region. Smart Fish, Indian Ocean Commission.

13.4 Air quality and noise

-

13.5 Heritage resources and visual environment

13.5.1 Cultural heritage resources

13.5.2 Archeology and paleontology

Gregory Middleton letters and mails.

13.5.3 Landscape and visual environment

-

14 Appendices

14.1 Stakeholder Engagement Plan

The stakeholder engagement plan (SEP) is a tool to identify and mobilize all the people, groups and institutions impacted by the project.

It helps to clarify, to better manage, the interests, fears, motivations, and expectations of the various stakeholders in the project. It leads to the development of a structured communication system and proposals for collaboration based on the motivations and skills present locally. The SEP also participates in the multiplication and structuring of the interactions between the different stakeholders and asserts the social legitimacy of the project.

14.1.1 Legislative and regulatory framework

The public consultation in the framework of an environmental and social impact assessment (ESIA) process is governed by national legislation and international regulations. These are listed and discussed in the sections below:

- The legislation and guidelines of the Government of Mauritius;
- International standards and guidelines

14.1.1.1 Mauritian legal framework

14.1.1.1.1 The Environment Protection Act, 2002

The Environment Protection Act, Law No. 19 of 2002, is the legal instrument governing the production of environmental impact studies in Mauritius.

Paragraph 92 establishes the specific regulations for Rodrigues: the Regional Assembly may, after consultation with the Rodrigues Environment Committee, make regulations applicable to the island of Rodrigues. These include projects requiring preliminary environmental reports and environmental impact assessment licences.

With respect to the consultations, the Environment Protection Act, in paragraph 19, establishes that the environmental impact assessment should defer the details of any public consultation held in the project area. The act therefore contains a very clear indication that any environmental impact assessment process should include a stakeholder consultation approach.

14.1.1.1.2 The 2004 guidelines

The guidelines for the environmental impact assessment, published in 2004 by the Environment Department of the Ministry of the environment of Mauritius, provide specific guidance on the requirement and nature of the reporting of consultations to be carried out within the framework of the EIA. It indicated that the engagement documentation should include (paragraph 4.5.2):

- Statutory bodies, environmental and accreditation groups and local residents likely to be affected by the proposals;
- The means to contact and advertise the project (leaflets, public postings, questionnaires, letters, etc.);
- A brief summary of their responses detailing the emphasized issues of concern and their contribution to the EIA.

For any development project namely the construction of hotels, golf courses, piers, etc. in the coastal area, the developer must consult the fishermen in the area to explain their project. The consultation is under the aegis of the ministry of fishing.

14.1.1.2 International standards

14.1.1.2.1 Equator Principles

Adopted in 2003 (and updated in 2013), the 89 Equator Principles form a reference document for the financial sector. Voluntarily adopted by financial institutions, they aim to take into consideration (identification, evaluation and management) the social and environmental risks in project financing. Principle 5 aims, in particular, at ensuring the effective participation of stakeholders in a continuous and structured process adapted to the local culture of affected communities and other stakeholders.

14.1.1.2.2 IFC performance standards and good practices

The eight performance standards of the International Finance Corporation (IFC) are a series of guidelines for partners benefiting from IFC direct investments. These are aimed at identifying environmental and social risks and impacts so that they are minimized and properly managed, in order to conduct activities in a sustainable manner and enhance development opportunities. In this regard, these performance standards also cover the obligations of partners to collaborate with stakeholders and to provide them with information on project-level activities. IFC performance standard no. 1, entitled "environmental and social risk assessment and management", includes specific requirements for stakeholder engagement in projects, including communication and grievance management (paragraphs 25 to 36). This standard no. 1 emphasizes the following aspects:

- Ensure that people who are likely to be affected by or may be interested in projects are involved as stakeholders, with particular attention to vulnerable and/or disadvantaged groups;
- Manage external communication in order to reach relevant stakeholders and facilitate dialogue between projects and stakeholders;
- Adapt stakeholder engagement to the specificities of projects and those of affected communities, ensuring that an information and consultation approach tailored to the local and effective context is implemented;
- Disseminate relevant project information to assist stakeholders in understanding the risks, impacts and opportunities associated with them (including issues related to the objective, nature, scale, duration of projects, potential associated environmental and social impacts as well as proposed mitigation measures, stakeholder engagement process and project complaints and grievances management mechanism);
- Ensure that a dual process of information and consultation is carried out, from the outset of the project planning phase with all relevant stakeholders, that it is conducted appropriately from a cultural point of view, free from any intimidation or coercion and that it is duly documented and finally that the stakeholders are able to express their opinion and that it is genuinely taken into consideration by the projects.

For the IFC, an effective consultation process should:

- Start at an early stage in the process of identifying risks and environmental and social impacts and continue as long as risks and impacts materialise;
- Be based on the prior disclosure and dissemination of relevant, transparent, objective, useful and readily accessible information presented in one or more indigenous

languages, in a culturally acceptable form, and understandable by the affected communities;

- Focus on inclusive participation of directly affected communities rather than other communities;
- Be free from manipulation, interference, coercion or intimidation by others;
- Allow real participation, where applicable; and
- Be described in the reports.

14.1.1.2.3 Specific FDA guidelines

In the guidelines for the realisation of an environmental impact assessment of an airport project, the French Development Agency (FDA) clearly indicates the incentive to public consultation from the outset of the project: "The FDA encourages the project initiator to leverage the ability of individuals, groups and communities to assert their views and concerns in relation to the projects that affect them. To this end, the FDA supports the initiatives of the project developer in matters of public consultation ". Communication plans are to be foreseen for this purpose. The FDA also recommends that public consultations be started at the study stages, involving all parties concerned. Also "if particular communities are likely to be affected by the project, it is suggested to the project initiator to document the potential impacts of the project on these communities. To this end, he will have to report on the exchanges he has had with them in order to inform them and, when appropriate, the measures taken to optimise the project according to its consequences relating to the particular communities."

The guideline also mentions – Chapter 1.2 – the requirement for a process description of the consultations conducted to understand the needs, perspectives and concerns of the population. A report must also be made concerning the results of these consultations. "In addition to public information and consultation sessions, the project initiator is encouraged to collect, as comprehensively as possible, all the concerns and perspectives of individuals, groups and communities involved in a project using methods such as questionnaire surveys, individual or group interviews, documentation reviews, etc. (...) The study must also highlight the main economic, social and environmental strengths or constraints that the initiator must take into consideration in planning the project".

14.1.2 Approach for the analysis and planning of the engagement of the stakeholders

The stakeholder engagement plan (SEP) aims to guide the informed consultation and participation activities that will be conducted throughout the process of updating the impact studies and subsequent stages of the project. This SEP was carried out in parallel with the realisation of the basic socio-economic study.

14.1.2.1 SEP study area

The study area for the development of this SEP encompasses all the areas taken into consideration in the basic socio-economic study. The project area covers a set of towns located in:

- Directly impacted areas;
- The areas that can accommodate people and activities likely to be impacted and resettled.

Table 144: Names and demographics of villages and areas of activity affected by the project

Impact area	Town	Job	Job type	Estimated population (2019)
Plaine Corail	Sainte Marie	Village	Living place	44
	Bangélique	Activity area	Fishing and livestock breeding	0
	Pointe Corail	Activity area	Fishing	0
	Plaine Corail	Village	Living place	40

14.1.2.2 Engagement activities already carried out

The community engagement activities began formally with regular relations and meetings between the Executive Council of the Rodrigues Regional Assembly and the directly impacted populations. These community engagement activities took place on the following timeline;

- 25 June, 2018

An internal meeting chaired by Davis Hee Hong Wye, Island Chief Executive (ICE), was held at the Central Administration conference room (Island Chief Executive's Office) in Port Mathurin for the community relocation plan. The main objective was to establish a steering committee composed of representatives of the various government entities and other stakeholders involved in the resettlement.

- 28 June, 2018 and 2 July, 2018

Preliminary census by the officers of the Land Registry Office and the officers of the Agriculture Commission for the identification of families eligible for resettlement and inventory.

- 5 July, 2018

An internal meeting chaired by Davis Hee Hong Wye (ICE) was held at La Résidence (Chief Commissioner's Office) in Port Mathurin to review the initial information already collected in the field and to assess the need to refine the data available, particularly with regard to the Agriculture Commission and the Fishing Commission.

- 13 July, 2018

Consultative assembly in the conference room of the Plaine Corail police station bringing together the entire Executive Council, the villagers of Sainte Marie and all those having an activity in the area concerned. The objective was to officially provide information about the project to expand the airport runway and therefore the need for relocation of homes in the impacted area and supporting those individuals who carry out an activity there.

- 9 August, 2018

Meeting of the Steering Committee established in June with the villagers concerned in order to collect their grievances and their choices or preference for the type of support procedures (compensation or relocation).

- 20 August, 2018

Development of a census timetable and sending of letters to the people concerned in order to communicate the dates of beginning and closing of the census.

- 22 - 24 August, 2018

Detailed census of dwellings and families taking into consideration their properties, main activities and attached buildings as well as the services and facilities available in the area.

- 31 August, 2018

Submission of the detailed census report.

- 4 September, 2018

Internal meeting of the Executive Committee for a presentation to the various Commissioners of the situation and progress concerning the relocation of the villagers of Sainte Marie.

- 12 September, 2018

Visit to the residential relocation sites proposed by the Commissioners, the Steering Committee of the resettlement project and the inhabitants to be relocated from the village of Sainte Marie.

- 27 September, 2018

Meeting of the Executive Committee chaired by Davis Hee Hong Wye (ICE) with the villagers of Sainte Marie, who have not approved the relocation site originally proposed.

- 26 October, 2018

Submission by the Land Registry Office of potential sites for the relocation of Sainte Marie's households to the Executive Committee.

- 22 November, 2018

Meeting of the Executive Committee chaired by Davis Hee Hong Wye (ICE) with villagers who had not approved the proposed relocation site initially for a presentation and visit of new proposed sites. Then presentation to all the villagers of Sainte Marie of a draft of the agreement documents for resettlement.

- 27 November, 2018

Submission by the land registry office of the report of the land parcels approved by the villagers of Sainte Marie.

- 10 January, 2019

Internal meeting of the Executive Committee with the Steering Committee of the resettlement project to take stock of all the advances made and measures taken during the last few months.

- 28 February, 2019

Submission of a report by the Agriculture Commission concerning the offers of compensation to the villagers of Sainte Marie in relation to food crops.

- 6 March, 2019

Submission of a report by the Fishing Commission on the compensation mechanism for the abandonment of net fishing activities (in accordance with the national budget of 2014).

- 8 March, 2019

Submission of the valuation report of the market value of the houses of the villagers of Sainte Marie by the evaluation department of the Ministry of Finance and Economic Development of Mauritius.

- 15 March, 2019

Submission of the report of the Fishing Commission concerning the census of fishing posts in the impacted area.

- 19 March, 2019

Submission of a report by the Agriculture Commission on the compensation mechanism for villagers engaged in animal husbandry.

- 2 April, 2019

Sending of letters by the Executive Committee to all the villagers of Sainte Marie to inform them of the amounts assessed by the evaluation department of the Ministry of Finance and Economic Development of Mauritius and to establish a date of meeting in order to discuss these announced amounts.

- 11 April, 2019

Meeting of the Executive Committee with the owners of the fishing posts of the impacted area of Plaine Corail.

14.1.2.3 Methodology, approach and means

A team from Insuco made up of two international experts, a national consultant and a national investigator, undertook a mission in the study area from 1 to 17 April, 2019, to collect the data necessary for the drafting of this SEP.

Stakeholder engagement involved meetings with the various stakeholders at the local level, from the Regional Assembly with the various communities directly and indirectly impacted, as well as those connected with the Rodrigues airport. This SEP was conducted by Insuco concomitantly with the update of the socio-economic baseline study (SEBS).

14.1.2.3.1 Methodology for project definition of the engagement and consultation of the stakeholders

The methodology used consists of:

- Identifying stakeholders who may have an interest in the project and those that may be affected, to establish a typology and an analysis of their relationships;
- Monitoring and initiating discussions with different types of stakeholders, in participatory public consultations targeting each of the identified groups in the study area, individual or restricted discussion groups, or official meetings. The objectives of these discussions are to share the information available on the project, and on the other hand to collect over a short time the perceptions (fears and expectations and even recommendations) of all stakeholders involved. These public or restricted meetings and interviews have been the subject of minutes and detailed reports. In addition, the attendance lists of the consultations obtained in the towns visited and a register of the people consulted are reported.
- Capitalizing on the perceptions collected from stakeholders and then developing a SEP.

14.1.2.3.2 Approach

The actions taken to develop the SEP have been focused on three key elements of the engagement, namely:

- Exchanges of information concerning the project, mainly aimed at verifying the current state of knowledge of the project of the communities and understanding through which channels the information has been acquired and circulating. A comprehensive and solid information flow is an essential condition for the facilitation of the circulation of information to reduce the risks associated with a misunderstanding of the project's implementation process.

- Stakeholder consultations to identify their views, concerns, expectations and recommendations with respect to key issues related to the implementation of the project, so that the targeted effective mitigation measures that are needed can be developed.
- In the course of the consultations, aspects of the flow of information and mechanisms facilitating communication, dialogue and consultation have been highlighted and have been a specific focus.

In order to do this, participatory public meetings were held with villagers from the towns impacted by the project. The public consultations were organized in two specific towns affected by the project. This ensured an effective participation of the representatives of the impacted communities, but above all permitted us to take into consideration the particular issues affecting each of the towns. It was also important to assess the balances and territorial relationships between the two towns identified, in order to anticipate possible problems of marginalisation of certain communities.

The public consultations affected more than 20 people in the two small towns – whose presence was formally recorded and documented – some people also attended public meetings without necessarily leaving a written record of their presence. Particular attention has been paid to the participation of women. In this regard, it should be noted that women were free to participate in the consultations without the need to be expressly invited to speak.

14.1.2.3.3 Communication media

Language elements were prepared and used for the presentation of the mission during the SEP. This included the key elements of the project's presentation to ensure a harmonized discussion of one community with another. An information document concerning the context of the rather succinct project was also developed, but the need for its use in the field did not occur.

14.1.2.3.4 Limits

Despite a sometimes limited flow of information, particularly at the indirectly impacted town level (proposed to be the place of relocation), most of the participants in the consultations seemed to have sufficient knowledge to form a realistic opinion as to the specific issues related to the project implementation and the impact on the territory. This lack of continuity of information circulation did not seem to impose any particular limit on the animation of the discussions during the consultations.

14.1.3 Identification and analysis of the stakeholders

For the purposes of this SEP, the stakeholders are identified on the basis of the IFC definition¹¹ as "persons or groups that are directly or indirectly affected by a project as well as those with interests in a project and/or the ability to influence its results, whether positively or negatively. Stakeholders may include locally affected communities or individuals as well as their official and unofficial representatives, local or national government authorities, politicians, religious leaders, civil society groups and organisations with their special interests, the educational world or other enterprises".

¹¹ IFC - Handbook of good practices for enterprises conducting business in developing markets, May 2007

The table below lists by type the main stakeholders identified. The list of stakeholders will continue to evolve for the duration of the project.

Table 145: List and typology of stakeholders

Entity	Main referents	Prerogatives/description
Regional administration		
Executive Committee of the Rodrigues Regional Assembly (RRA)	<i>Island Chief Executive</i>	The <i>Island Chief Executive</i> is a key position as secretary of the Executive Committee. It is defined under the title of <i>Island Chief Executive</i> . His mission is to ensure the implementation of all the measures taken at the meetings of the Executive Committee by each of the Commissioners.
The company initiating the project		
Airport of Rodrigues Limited	<i>Airport Manager</i> <i>Operations and Maintenance Manager</i>	The Airport of Rodrigues, with a desire to increase its passenger and air cargo capacity, is at the initiative of the project to expand the runway, supported for years by the Rodrigues Regional Assembly.
Communities		
Villagers of Sainte Marie	Spokesperson of Sainte Marie	All the people living in the town, who will be directly impacted by the project. The estimated number of people is 44 inhabitants. The inhabitants of Sainte Marie are the people who will be the subject of a relocation of their homes
Villagers of Plaine Corail		All the people living in the town primarily proposed to be the resettlement location of the inhabitants of Sainte Marie. The estimated number of people is 70 inhabitants throughout the area.
Net fishermen	Fishing station managers	The fishermen of the impacted area of Plaine Corail are positioned in the three subdivisions called Bangélique, Caverne Bouteille and Pointe Corail. Their method of operation is closer to the cooperative system. These fishermen do not have their main residence in the area but are users with fishing infrastructures.
Bangélique livestock breeders		Livestock breeders who use old unused fishing posts as infrastructure, which are readapted as a holding pen for their animals overnight. They use the area as a free grazing area during the day.
Cooperating Actors with the development		
Financial partners	FDA / EU	Actors providing financial support in the development cooperation sector.
Media		
Radio Rodrigues		Only radio transmission on the island that plays a role in the transmission of information related to the different projects of the island and if necessary in relation to information about the village assemblies organized by the local government.

14.1.3.1 Analysis of the leverage of influence of stakeholders in the project

The analysis of stakeholder leverage helps to determine the potential interactions of stakeholders concerning the project. This exercise helps to guide the stakeholder engagement strategy, both in the planning phase and in the follow-up and evaluation phases of the engagement plan.



The listed levers of influence were categorized in the following table in terms of positive influence (potential strengths for the project) and negative influences (potential brakes for the project). Influences are evaluated according to the degree of potential impact (high, medium, low) on the project.

Stakeholders	Close guardianship authorities		Initiating company		Directly impacted resident community	
	Executive Committee – Regional Assembly		Airport of Rodrigues Limited (ARL)		Villagers of Sainte Marie	
Potential levers of stakeholders concerning the project	Importance	Interference	Importance	Interference	Importance	Interference
	Administrative facilitation	Very weak capacity to slow down project activities	Administrative facilitation	Very weak capacity to interrupt project activities	Full acceptance of the project	Weak capacity to block project activities
	Community awareness program	Very weak capacity to slow the evolution of the project	Intervention in case of problems		Weak role of influence on other user communities in the area	In case of disagreement, moderate capacity to demobilize the population
	Facilitation of negotiations					
Intensity of influence		Intervention in case of problems				
	Strong	Week	Strong	Weak	Moderate	Weak

Stakeholders	Directly impacted user community		Directly impacted user community		Indirectly impacted community	
	Fishermen (fishing posts)		Bangélique livestock breeders		Villagers of Plaine Corail	
	Importance	Interference	Importance	Interference	Importance	Interference
Potential levers of stakeholders concerning the project	Full acceptance of the project	Weak capacity to block project activities	Full acceptance of the project	Weak capacity to block project activities	Full acceptance of the project	Moderate blocking and disturbance capacity
	Weak role of influence on other user communities in the area		Weak role of influence on other user communities in the area		Weak role of influence on other user communities in the area	In case of disagreement, weak capacity to demobilize the population

Intensity of influence	Weak	Weak	Weak	Weak	Weak	Weak
-------------------------------	------	------	------	------	------	------

Stakeholders	Financial partners		Media (radio)	
	Importance	Interference	Importance	Interference
Potential levers of stakeholders concerning the project	Indispensable partners for the financing and therefore the implementation of the project	Strong capacity to block the operation of the project in case of non-compliance with the standards	Community awareness program	Relay of rumours to the population in case of lack of or insufficient communication from the company
	Potential partners for the promotion of transparency and good governance		Facilitation of the circulation of information	
Intensity of influence	Strong	Strong	Weak	Weak

14.1.4 Stakeholder consultation: a summary of perceptions of the project

14.1.4.1 Presentation of the consultations performed

During the preparation of the SEP, the following meetings and consultations were carried out.

Phase	Date	Place of consultation	Entities represented/persons consulted	Medium
Exploratory	04/03/19	Plaine Corail	Airport Operational & Maintenance Manager ESIA project manager and SETEC consultants Environmental impact consultants	Meeting
Exploratory	04/03/19	Port Mathurin	Island Chief Executive and Assistant Airport Manager Airport Operational & Maintenance Manager ESIA project manager and SETEC consultants	Meeting
Exploratory	04/06/19	La Ferme	Island Chief Executive and assistants Airport Manager Airport Operational & Maintenance Manager External socio-economic study consultants	Lunch meeting
SEP	04/10/19	Caverne Bouteille	Fishing station manager (individuals)	Individual consultation
SEP	04/11/19	Sainte Marie	Village spokesperson	Individual consultation
SEP	04/11/19	Sainte Marie	Inhabitants of Sainte Marie	Public consultation
SEP	04/11/19	Sainte Marie	Fisherman of Sainte Marie	Individual consultation
SEP	04/12/19	Maréchal	Fishing station manager (Bangélique)	Individual consultation
SEP	04/13/19	Plaine Corail	Resident of Plaine Corail	Individual consultation
SEP	04/14/19	Sainte Marie	All the inhabitants of Sainte Marie	Public consultation
SEP	04/15/19	Plaine Corail	All the inhabitants of Plaine Corail	Public consultation
SEP	04/15/19	Bangélique	Bangélique livestock breeder (non-resident)	Individual consultation
SEP	05/03/19	Anse Quito	Anse Quito village committee	Public consultation
SEP	05/03/19	Cascade Jean Louis	President of the village of Cascade Jean Louis	Individual consultation
Exploratory	05/08/19	Port Mathurin	Resettlement Committee (RRA)	Meeting
Exploratory	05/09/19	Citronelle	Director of agricultural services	Meeting

14.1.4.2 Knowledge and general opinion of the stakeholders concerning the project

14.1.4.2.1 Information concerning the Rodrigues project

The project to expand the runway of the Rodrigues airport has been discussed for some years (since about 2011) on the island. The information, which was eventually officially declared only in July 2018, had had time to circulate very easily throughout the territory of Rodrigues during these years. Today, the entire population of the island is aware of the airport project.

14.1.4.2.1.1 Information concerning the directly impacted populations

The official announcement of the launching of the stages of the project was made during a public meeting held at the conference room of the police station of Plaine Corail and where the inhabitants and users of the affected area, namely the inhabitants of the village of Sainte Marie, fishermen users of fishing posts and finally livestock breeders using the area as pasture were primarily invited.

During the various community and individual consultations, the inhabitants and users of the area impacted by the project displayed a very high level of knowledge concerning the project, even going to the limits of impact.

The special nature of this project lies in the fact that the local authorities are already very advanced in the discussions with the inhabitants and users of the impacted area. Thus, communication and information has been able to circulate fairly regularly since the initial official announcement of July 2018. However, given the level of progress regarding the relocation plans of the inhabitants of the village of Sainte Marie, there is still some missing information or at least questions from the villagers that must be displaced. These questions are mainly based on the issue of livestock breeding for the villagers (the main activity for the vast majority).

As for the users (non-residents) of the impacted area, fishermen of the fishing posts still in operation and Bangélique livestock breeders, they seemed rather well informed on all the elements of the project and did not display any concern over the need to relocate their activity.

14.1.4.2.1.2 Information concerning the populations indirectly impacted

Like the inhabitants of the impacted area, the inhabitants of the town of Plaine Corail, which is the main resettlement location of the villagers of Sainte Marie, have had the information of the airport project for a number of years prior to the official announcement made by the local authorities.

While the information circulated more frequently after the official announcement of July 2018, no direct consultation has been carried out to date with the inhabitants of the town,

The villagers of Plaine Corail know indirectly that their village is the resettlement area, especially after observing a site visit of the authorities and the villagers of Sainte Marie in their town. Some villagers of Plaine Corail even claim to know exactly where the families of Sainte Marie will be resettled.

14.1.4.2.2 General opinion of the stakeholders concerning the project

From all the consultations, interviews and meetings conducted in the field through Rodrigues or in areas directly and indirectly impacted, it is important to note that the airport project is the subject of a consensus. No one encountered any opinion against the introduction of the new airstrip.

14.1.4.2.2.1 General opinion of people directly impacted

Despite the fact that the villagers of Sainte Marie have to leave their living place and the quality of life specific to their town, the opinion of the inhabitants on the project is always favourable: "We cannot go against such projects for the development of our island, this airport project is a good thing for Rodrigues, even if it is us who are directly affected" expresses the spokesperson of Sainte Marie. "We are well aware that our lifestyles will change and we hope that we can adapt quickly to the living area where we will be resettled."

It is exactly the same for fishermen and livestock breeders in the impacted area. The approval of the project is general and despite the fact that the methods of operation will change in a certain way for them, they fully endorse the implementation of the project.

14.1.4.2.2.2 General opinion of people indirectly impacted

For the inhabitants of Plaine Corail, it is the same observation. All are in agreement with the project despite the concern about the new methods of organisation (especially with regard to livestock breeding) that they will have to put in place if the inhabitants of Sainte Marie settle in their town in order to ensure good social cohesion.

The airport project is for them also an opportunity to improve the standard of living with certainly new work opportunities that will be created. They hope, of course, that their community will be voluntarily integrated into this future development.

14.1.4.3 Positioning in relation to the main issues

14.1.4.3.1 Loss of land and relocations

The issue of physical and economic relocations caused by the footprint of the project is central to the local public debate. The question is debated both at the level of the community that is supposed to be displaced, and at the level of the communities that inhabit the proposed areas for resettlement. The idea that resettlement is a necessary event is, as indicated previously, commonly accepted by the locals. The local discussion is mainly structured in relation to the conditions for implementing and monitoring this process.

The issues that are at the centre of the concerns regarding resettlement are dealt with in the following paragraphs.

14.1.4.4 The challenge of pursuing livestock breeding activities

While the physical displacement of dwellings is not the main concern of the inhabitants, who are supposed to leave the project's direct impact zone, the issue that is most important is certainly livestock. Livestock breeding is considered to be the main economic activity in the area and concerns both the inhabitants of Sainte Marie, as well as the non-resident livestock breeders who frequent the Bangélique plain, and the inhabitants of the area of Plaine Corail, which was approached for the relocation of the people affected by the project.

14.1.4.4.1 The inhabitants of Sainte Marie

For the inhabitants of Sainte Marie, who practice an extensive type of pasturing with free grazing, the matter of maintaining an economy highly based on this activity is a central issue. It is formulated in the following manner:

- To what extent will the resettlement conditions permit the continuation of the livestock breeding activity?
- To what extent will the resettlement support initiatives permit the integration of technical innovations that enable the continuation of pastoral activity on smaller areas?
- What are the support measures for conversion to other income-generating activities, as an alternative to livestock breeding?

The inhabitants of Sainte Marie are aware that extensive and free-range livestock breeding is not possible in the new resettlement areas. Space is less abundant, and it is already subject to the grazing of the cattle of the inhabitants of Plaine Corail. To this is added an additional constraint: the large pasture reserves that have permitted until today the maintenance of an extensive pastoral model in the area – the site of Eau Vert, for example, where some livestock breeders of Sainte Marie leave their herds is severely threatened by a species of invasive acacia (*Acacia nilotica* or *pikan loulou*) which greatly reduces its capacity.

"In Eau Vert, *pikan loulou* has spread so much in recent years that I think that within three to five years it will be impossible to practice livestock breeding in the area as we do today" (Livestock breeder concerning the site of Eau-Vert. Resident of the village of Sainte Marie)

In perspective, pastoral spaces are doomed to be reduced throughout the entire area. This is a fact that the livestock breeders of Sainte Marie take into consideration. The challenge for them is to obtain guarantees in relation to the support measures that the regional government could put in place in order to support a transitional phase that permits:

- Integration of less extensive techniques to reduce the size of herds (with the necessary infrastructures and equipment);
- Development of alternative economic activities to livestock breeding, which secure household incomes and permit young people to stay in the area.

Considering the fact that, according to the livestock breeders of Sainte Marie, their animals would have difficulty adapting to a model of non-extensive farming, the necessity of supporting a technical conversion is considered to be the most important and very urgent.

In summary, the solutions proposed by livestock breeders who need to be relocated, are structured in relation to three (non-exclusive) options:

- Active public intervention, aimed at the maintenance and conservation of remote grazing areas. This solution is highly dependent on the technical capacity to counteract the expansion of invasive plants.
- Effective support – technical and financial – for the integration of a less extensive farming model, needing less space.
- Temporary support during the period of conversion to other economic activities.

14.1.4.4.2 The inhabitants of Plaine Corail

For the inhabitants of Plaine Corail, an area proposed for the resettlement of most of the families of Sainte Marie, the reception of the new neighbours is not a problem in itself. On the other hand, the fear is very high with regard to the impact caused by the herds of the inhabitants of Sainte Marie in terms of pressure on local resources.

"We cannot refuse to welcome the inhabitants of Sainte Marie, we are all human and this could very well have happened to us. The problem is that they have a lot of animals. How are we going to organize to accommodate so many animals in the area? (Farmer-livestock breeder of Plaine Corail)

The inhabitants of Plaine Corail tend towards the practice of a livestock breeding model based on the constant penning of the animals and the development of the pastoral space in fenced and contained parcels (also equipped with operating permits). It is indeed a model opposite to the one that is practiced in the plain of Bangélique.

Above all, both models are not considered compatible. The prospect of receiving a large influx of animals left in freedom is causing a real fear among the inhabitants of Plaine Corail. This fear threatens a peaceful process of welcoming and integration. Faced with this challenge, the inhabitants of Plaine Corail propose solutions very similar to those proposed by the inhabitants of Sainte Marie: the maintenance of pasture areas dedicated to extensive livestock breeding, distant from the village; and conversion to a holding area model and physical delimitation of forage parcels.

It should be noted that the establishment of a process of consultation and dialogue concerning this type of technical solutions and support measures, which permits members of both communities to understand that they share the same fears and are considering the same solutions, would be very productive.

14.1.4.4.3 Non-resident livestock breeders of Bangélique

Non-resident livestock breeders who leave their cattle in free grazing in the Bangélique area face the same problem of loss of grazing space. Alternative areas are scarce and are likely to be less and less suitable for grazing because of the expansion of invasive plants. Relocation options are reduced.

It would be desirable for them to be actively involved, as economically displaced people, in the process of consultation and engagement in relation to shared solutions, with the communities of Sainte Marie and Plaine Corail.

The issue of resettlement depends largely on the option of a policy of preservation, on the part of the regional authorities, of grazing areas by actively protecting them from the expansion of invasive plants such as the *pikan loulou*.

Also, for some livestock breeders, the option to reduce the size of the herd, if the extensive model is no longer possible, is quite feasible.

A characteristic of the livestock breeding in Bangélique, indicated in discussions with owners of non-resident herds, is that the maintenance of the herd on the site does not represent only an economic activity. Livestock breeding also has a contemplative function, highly connected to the landscape. In this specific case, the reduction of the herd would not be *a priori* an option to refuse, as long as maintaining a minimum number of heads permits them to maintain an activity the main value of which is personal well-being.

"I would be ready to reduce the herd, if I can keep coming to see my cows at the seaside"
(non-resident livestock breeder. Bangélique)

14.1.4.5 The issue of access to fishing sites

An economic relocation proposal was made to the fishermen in the impacted area. However, the issue of restoring current conditions is not fully resolved, because for the fishermen a number of concerns remain unresolved.

14.1.4.5.1 At the level of fishing posts (*fishing posts*)

The displacement of the fishing posts raises various issues. The area of Les Salines is proposed for the reconstruction of the structures and the mooring location. The fishermen of Bangélique fear that this option may have economic consequences on their activity because, in order to go to the usual fishing sites, the distances would be more significant and the fuel costs could increase significantly. At present the fishing boats use sails primarily. The area proposed in Les Salines is little protected inside the Baie Topaze and the use of an engine will become practically obligatory.

14.1.4.5.2 At the level of individual professional fishermen

The fear expressed by the managers of the fishing posts is the same as that evoked by the individual fishermen who gravitate around the mooring areas of Bangélique: the distance to the fishing site. For them, the issue is perhaps more important because they are more likely to use an engine, even if they try to limit their use and their fishing sites lie behind Crab Island, one of the largest parts of the island's lagoon.

"Today, during the windless periods during which I have to use the engine, I spend Rs 150 to go, come back and go again the next day to my fishing site. While from the inside of Baie Topaze, I will practically have to spend this Rs 150 just to get to the site" (Individual fisherman. Sainte Marie)

The fishermen of Sainte Marie prefer the fishing sites in the lagoon, and avoid the reefs. This helps to reduce the risk of loss of material – traps, in particular – that you take when you are closer to the coral reef. With the relocation of the mooring site and the remoteness of the known sites in the lagoon, fishermen fear that they must also orient themselves towards the reefs, which they can control less well than the lagoon and which is not part of their current practices.

14.1.4.6 The issue of the loss of farmland

According to the various consultations and interviews conducted in the field, the loss of farmland is apparently not a major issue, since it is anticipated, based on discussions already initiated with the local government, that exploitable surfaces will be made available in the relocation sites.

However, the inhabitants of Sainte Marie spoke of the fact that their know-how in agro-pastoral procedures had allowed them to obtain today a quality of soil that is not negligible and this particularly in an area where the rock is mainly outcroppings. It will be difficult to find or restore the same levels of soil quality. It is an operation that requires work and support measures. The issue, from the point of view of the inhabitants of Sainte Marie, is to have guarantees that they will be supported in this process.

14.1.4.7 The issue of physical resettlement

The relocation of dwellings, for the inhabitants of Sainte Marie, does not seem to be at the centre of a major concern. In fact, very prompt action has been taken by the regional government to reassure people who may be physically displaced. This implies the fact that all the houses would be rebuilt elsewhere, according to standards at least equal, and probably better, than those of the current houses. The steps already begun in that the inventory of goods, the calculation of surfaces, and the identification of relocation sites have prevented the issue of housing from causing fears or uncertainties for the population of Sainte Marie.

For the inhabitants of Sainte Marie, resettlement has a major advantage: to get closer to the paved road and thus to public transport, services and schools.

14.1.4.8 The demographic issue and cohabitation in resettlement places

Although the physical displacement generated by the project is very limited (a maximum of fifteen families), in view of the socio-demographic configuration of Plaine Corail and the current size of human settlements, the resettlement process represents a large demographic issue locally.

The population of the Plaine Corail area, which is being proposed for relocation, also has about fifteen households. Most are concentrated in the area located at the top of the site of Les Salines. The basic social study has shown that it is a community structured mainly around kinship relationships. Integrating a part of the families of Sainte Marie into the territory corresponds to doubling the local population. For the inhabitants of Plaine Corail, the reception of the families of Sainte Marie is not a concern. It is rather considered a duty to welcome new neighbours. The greatest concern, therefore, involves the livestock breeding activity and the maintenance of an extensive pastoral model.

It is thus important to stress again that, since these concerns concern both the host population and the displaced population, a support for dialogue remains a priority to ensure that the quality of cohabitation is not threatened.

There are still two underlying issues:

- The first one is mentioned mainly at the level of Plaine Corail. The site is experiencing a water supply problem. The fear is that the increase in the number of users can further degrade the conditions of supply. The solution envisaged by the inhabitants is that the settlement of the people affected by the project is above all an opportunity to improve the conditions for the provision of services in the reception area.
- The second issue is not always explicitly mentioned, but it is evident on several occasions. If displaced families were to receive substantial resettlement assistance, creating a situation of inequality in relation to the host population, this would be considered an act of injustice and would be an obstacle to the process of integrating the two communities. The desired option is for the host community to benefit from equivalent benefits, in terms of services and support measures, as the displaced population. This aspect is all the more important since, according to the basic social study, the current economic conditions of the population of Sainte Marie are, in many aspects, better than those of the population of Plaine Corail. The differences are not very significant, but obviously the families of Sainte Marie, developing an economy strongly based on diversification and integration between different activities (fisheries/agriculture/livestock breeding), and a strong propensity for self-consumption, has succeeded in creating relative wealth. In the confrontation with the host community, it is very important that the gap between economic situations is not perceived as an issue that could jeopardize social relations.

14.1.4.9 The issue of support measures for resettlement

Among the inhabitants of Sainte Marie, the question of relocation is formulated in a very clear way. A period of adaptation will be necessary to restore a standard of living and production. In addition, it will be difficult to reproduce the same economic conditions on the relocation site. Thus, for physically displaced people, it is essential that support measures be taken, in order not to make families vulnerable during the transitional period.

The focus is on the desirability of creating new opportunities and reconversion projects to strategic economic sectors. This has to be done with a view to decreasing income from livestock breeding. The option envisaged by the inhabitants of Sainte Marie is that of support for the emergence of small individual or family businesses. The women of the village are the most engaged in promoting this idea of an economic model. The opportunities would come from the development of the activities and the passage in the vicinity of the airport. Small craft businesses (food processing and conservation), lodging and restaurant activities, for example, are mentioned as individual projects that could be promoted as part of a resettlement assistance campaign.

With regard to the issue of equal opportunities between the host community and the relocated community, the idea that support for the promotion of the individual or family craft business concerns both the inhabitants of Sainte Marie and the inhabitants of Plaine Coral is to be considered seriously. In particular, projects involving women from both families could be a lever for a good resettlement process.

The establishment of a livelihood restoration plan, as advocated by international standards (IFC, ADB), is an implicit recommendation made by both communities.

14.1.4.10 Issues related to the physical environment

The question of the physical environment is mentioned only in a very sporadic way by the inhabitants of the directly impacted areas, and by the inhabitants of the resettlement sites.

"There are too few trees here and no animals apart from our cows and sheep and dogs, it is a difficult environment here" (Farmer-livestock breeder. Sainte Marie)

14.1.4.10.1 Issues related to air quality and living environment

The inhabitants of Plaine Corail are the only ones who have mentioned the already existing discomfort from the noises and smells of kerosene coming from arriving planes, especially during the warm and humid period of summer. They then express a concern about this, knowing that there will be larger carriers who come to park in front of the terminal. The locals then wonder if the noise and fuel smells will be more significant because the planes will be bigger.

"Sometimes, in the summer, when it's hot, the smell is so strong that you have to close the windows of the house, and it sometimes gives you a headache" (Inhabitant of Plaine Corail.)

14.1.4.11 Communication mechanisms, information, public consultation, dialogue

The inhabitants of Sainte Marie have been informed that the project will certainly result in their physical and economic resettlement. The communication and information system on this subject was very quickly implemented by the Executive Committee of the Rodrigues Regional Assembly. This has certainly helped to open up an effective communication and information channel. Up until now, it is within this framework that the conditions for resettlement have been negotiated. The Executive Committee of the Rodrigues Regional Assembly is the main interlocutor of the community.

In this regard, a concern expressed by the inhabitants of Sainte Marie is that, if the Rodrigues Regional Assembly remains the only institution that is discussing with the population, the negotiating framework may be too strict. The expansion of the framework to a wider

consultative table would be desired by the community. The reason indicated is that in case of disagreement, a recourse to mediation by other actors (institutional, civil society) would make it easier to unblock the situation. The community would also feel better ensured if the framework for engagement activities were to be designed in a broader manner.

The inhabitants of the proposed areas for the reception, for their part, believe that communication with the regional authorities would be more fluid and easier, if the community was organizing in a small committee, in order to centralise the flow of communication and, if necessary, to request more information.

14.1.5 Stakeholder engagement strategy

14.1.5.1 Key elements of the proposed engagement strategy

The aim here is to propose a stakeholder engagement strategy aligned with the respective needs of the project, populations and local dynamics. This strategy is based on a set of key points for the participation of stakeholders in the project:

- The IFC's good practices recommend stakeholder involvement at the earliest, in order to build good relationships, which will be reinforced over time. Dialogue with stakeholders from the outset of the project establishes a positive dynamic in relationships that will benefit in particular during potentially difficult periods or tensions. Engaging stakeholders to encourage them to collaborate on the project involves the development of direct relationships between them and the developer, based on a participatory approach. The establishment of effective and sustainable communication mechanisms (in terms of consultation, information and community participation, including the registration and management of complaints) is therefore the keystone of the engagement strategy.
- Respect for the reality (and especially in relation to livestock breeding activity and all that it implies) of local authorities is essential to ensure their full cooperation and thus facilitate relations with the villagers. It is therefore important to involve them in the evaluation phases of the impacts and the PGES, as well as in the subsequent phases. The engagement strategy therefore relies on consultation and maximum association of local authorities.
- The establishment of representative village committees providing external and internal communication to communities is an asset because, even if the committees are not yet fully structured or functional, they are solid instruments from a legal and institutional viewpoint.
- The balances between communities (in particular the host community of Plaine Corail and the integrated community of Sainte Marie) can be a significant risk for the maintenance of good conditions of social understanding during the course of the project and of course thereafter. For this reason a very important pro-active policy of communication, consultation and transparency, is necessary to avoid that some individuals feel harmed by certain decisions made.

14.1.5.2 Stakeholders' engagement plan

On the basis of the analyses outlined above (stakeholder identification, influence levers analysis, key strategic points definition), the following stakeholder engagement activities are focused around the thematic area priorities identified during the consultations, while specifying the recommended levels of engagement. The suggested engagement levels are as follows:



- Collaboration – which is the search for the participation of stakeholders in the project, their involvement, but without joint execution or sharing of responsibility (the stakeholder participates for validation purposes, but not for execution);
- Active association – which consists of an active contribution from the stakeholder, a joint execution of activities and a sharing of responsibilities;
- The consultation – which refers to the solicitation of the stakeholders' opinion, of their contributions, with the aim of taking into consideration the opinions and recommendations formulated;
- Information / awareness – which corresponds to a unilateral action by the developer aimed at transmitting and explaining information to stakeholders.

Stakeholders	Main referents	Favoured engagement method	Frequency	Short-term actions proposed for ARL	Priority level
Executive Committee of the Rodrigues Regional Assembly	Island Chief Executive and recognized members of the Committee	Regular and extraordinary meetings	When necessary	Support the establishment of the Regional Assembly communication system with the communities	High
		Regular meetings and mailings	Continuous	Promote the maintenance of communication and the transmission of information collected concerning the airport area	High
Villagers of Sainte Marie	Spokespersons and heads of households	Monitoring the proper application of the livestock breeders' resettlement process	When necessary	Support for the creation of a livestock breeders' committee concerning the relocation site	High
		Monitoring good village integration	Continuous	Ensure the maintenance of communication and the collection and transmission of grievances	Medium
		Dialogue on the progress of the project	Quarterly	Disseminate information about the project.	Medium
Fishermen in the impacted area (fishing posts)	Station managers	Monitoring the proper functioning of new fishing posts	Quarterly	Support, information dissemination	Weak
Livestock breeders	Bangélique livestock breeders and livestock breeders of Plaine Corail (host and resettlement areas)	Monitoring the proper application of the livestock breeders' resettlement process	When necessary	Support for the creation of a livestock breeders' committee concerning the relocation site	High
		Monitoring of the proper functioning of the use of the pastures	Monthly	Ensure the maintenance of communication and the collection and transmission of grievances	High
Villagers of Plaine Corail	Representatives of the inhabitants of Plaine Corail before the installation	Monitoring the proper application of the livestock breeders' resettlement process	When necessary	Support for the creation of a livestock breeders' committee concerning the relocation site	High
		Monitoring good village integration	Continuous	Ensure the maintenance of communication and the collection and transmission of grievances	Medium
Programs and Development project	Directors and agents of national and international programs	Meetings	When necessary	Search for articulation and support for the implementation of community projects	Weak
Media	Local radio	Press releases	When necessary	If necessary, transmit information and support creation of discussions	Weak

14.1.6 Complaint and grievance management mechanism

Establishing a complaint and grievance management system is one of the recommendations of the IFC, (Performance Standard 1, IFC, 2012). Such a system should allow people to express their complaints and grievances, whether they are registered, classified, analysed and to receive an appropriate response within "reasonable" time frames.

Complaints can have many origins, ranging from the need for attention from a stakeholder, to misunderstandings between the project and stakeholders due often to a lack of communication, to internal and/or external social and political manipulations, to internal project failures, etc.

In order to better manage these grievances and complaints, the project must therefore establish an out-of-court dispute resolution and management mechanism based on mediation, arbitration and constant dialogue.

14.1.6.1 Establish a complaint and grievance management mechanism that is accessible and effective

It is important for the project to quickly establish a complaint and grievance management mechanism, identified as such by all stakeholders in the area (and outside the area). The structuring of this mechanism must be elaborated by the institutional structure in charge of relations with local communities and the piloting of the resettlement and clearing processes. Once established, this mechanism must be popularized and all inhabitants of the social influence area of the project, informed of its method of operation. Its main features are the following:

- Known from major populations (or their representatives on a local scale);
- Easy to access and use;
- Easy to mobilise by everyone;
- Effective
- Just
- Ongoing in nature

Within the projects, responsibility for the structuring and management of this mechanism usually rests with the department in charge of the communities. In the case of the Rodrigues airport runway extension project, it is above all the regional authorities that have managed, until now, the issues related to population relations. It is therefore within the regional institutional structures that a specific complaint management mechanism could be designed and housed, in agreement with the project holder.

14.1.6.2 The different steps for management and processing of complaints

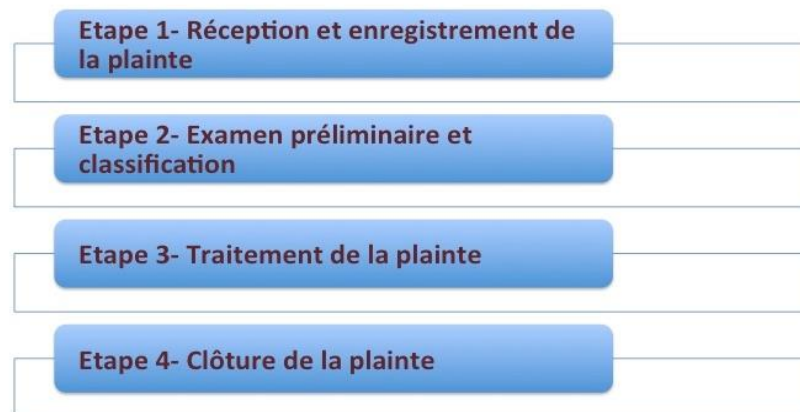


Figure 190: Complaint and grievance management steps

The above diagram summarizes the steps for management of complaints and grievances. Several other complementary activities may be required for each step.

Step 1: Receive the complaint at the access point (the access point could be a referral person, reachable by all stakeholders, responsible for this task through the regional institution or through any type of committee that controls the procedures), to document, to investigate, when necessary, and to refer the matter to the responsible people within the project.

Step 2: Assessment of the complaint: seriousness, magnitude, actors present, motives, etc. Acknowledge receipt of the complaint and present to stakeholders the manner in which it will be dealt with (specifying one or more deadlines). Based on this assessment, the level of complaint processing within the project should be determined (alert management and possibly authorities, or manage at the community team level).

Step 3: Decide on a complaint handling strategy, divide the tasks and responsibilities between the teams and members of the project. Consider investigating the complaint (involve local authorities as needed to ensure the legitimacy of the investigation), identify options for solutions. Respond to the complainant by stating the findings of the investigation and the proposed regulations.

The survey takes place according to the following steps:

- Travel to the site of the complaint to observe the situation in the field and meet the complainant(s);
- During this travel or after, depending on the possibilities, discuss it with the complainant(s) in order to obtain his (their) proposals for solutions, discuss with him (them) the different procedures for resolving the complaint, have him (them) provide proposals and determine his (their) preferences;
- Select a balanced solution to resolve the complaint with the complainant(s);
- Transmit the selected solution to the supervisor for validation (investigation report).
- If the complainant is satisfied the complaint can then be terminated, if not, then an appeal should be considered.

Step 4: It is necessary to respect the shortest possible deadlines for resolution of the complaint, to ensure a follow-up evaluation (with the complainant and internally) and then to

proceed to the official closure of the complaint (with the signature of both parties), and finally to file the folder in the archives.

14.1.6.3 Specify delays in processing of complaints

The implementation deadlines must be decided and clarified with the entire project team, the collaborators and the relevant stakeholders. The table below provides an example of how to structure complaint processing times. It can be discussed as a team and adapted to the means available to the project.

Steps	Time
Introduction and receipt	Immediate
Evaluate and assign roles and tasks	5 working days
Acknowledge receipt	Immediate
Investigation	Between 10 and 45 working days (depending on the complaint)
Response	5 working days
Possible appeal(s)	Depending on the appeal - to be determined
Monitoring, closing and archiving	Between 5 and 45 working days.

14.1.6.4 The different approaches advocated for the management of complaints

Several mechanisms can be implemented to deal with the complaint according to its gravity and scale:

Mediation: explain and clarify a conflict situation with regard to the rights and duties of each, the commitments made on both sides in the framework of the project. Recommended recourse to local authorities;

Implementation of actions and/or corrective measures: when it is proven that a third party, impacted by the activities of the project is adversely affected, the project will be responsible for proposing corrective actions. These measures should never be taken under threat and/or blackmail. A tense social situation should be appeased before new commitments to stakeholders are made.

Arbitration: the arbitration situation is strongly advised because it has the advantage of mobilizing local authorities (e.g. villagers) in order to produce a return to either a local agreement or the Law.

14.1.6.5 A mechanism that must always be kept open is the use of judicial procedures

It may be envisaged that the management of an internal complaint does not lead to an acceptable resolution for either party or both parties. The complainant must therefore retain the prerogative to exercise other remedies.

Any judicial process remains a solution for resolving disputes, despite the existence of a complaint and grievance management mechanism established within the project. While legal

remedies are lengthy and costly, the complainants will need to be informed, if the project mechanism does not allow an acceptable resolution, that they also have this recourse.

14.1.6.6 Develop an internal database for the compilation of complaints

In order to ensure proper management of the mechanism, the project has a specific database for the management of complaints. Through an Excel file, the project will be able to compile all the information on the complaints that has been filed. This is not only a matter of establishing a history and guaranteeing archiving, but also of establishing an effective tool for tracking complaints during processing.

This file will specify:

- History of complaints (closed)
- Nature of complaints
- Magnitude
- Location
- Relevant stakeholders
- Resolution mechanisms
- Processing period
- Solution found
- Processing times

14.1.7 Monitoring and reports of activities in which stakeholders are engaged

14.1.7.1 Monitoring of activities in which stakeholders are engaged

Stakeholder engagement activities will need to be monitored and controlled to ensure that consultation and information efforts are effective and in particular that stakeholders have been duly consulted throughout the process; the monitoring will include the following elements:

- Audit of the implementation of the stakeholder engagement plan;
- Monitoring of formal and informal consultations with communities and government authorities;
- Control of the effectiveness of engagement processes in the context of impact management, recording feedback from engagement activities and compiling and monitoring the level of implementation of community engagement;
- Monitoring of grievances and their resolution.

14.1.7.2 Periodic reports on the activities in which stakeholders are engaged

Periodic reports will permit the summarizing and documenting of all activities conducted. Quarterly reports will be able to include all the activities carried out for the period concerned. They will present a summary of the issues and grievances raised and how they were dealt with. These reports will include:

- The total number of stakeholders involved in each stakeholder category;
- The geographical location of stakeholders in and outside the project area;
- The number of comments and requests received and the responses made;
- The issues raised and the levels of support and opposition to the project;
- The nature and number of complaints and grievances registered and processed;
- The deadline for resolution of the grievances and handling of the complaints.

A stakeholder engagement report should also be published annually. It will present a summary of the main problems raised by stakeholders, the number and subjects of grievances, a

summary of the main actions carried out to address the concerns raised, an analysis of the trends of key performance indicators, and operational plans of engagement for the next period.

14.1.8 Conclusion

As the strategy for engaging stakeholders in the project is now formulated, it will then be the responsibility of the Airport of Rodrigues (ARL) to define the means it wants and to be able to mobilize to engage the stakeholders. The determination of these means will be an indispensable prerequisite for the operation of the strategy of engagement of the stakeholders proposed herein, in order to be able to break down the various strategic axes of engagement in planned and budgeted operational activities.

14.1.9 Annexes of the stakeholder engagement plan

14.1.9.1 Annex 1 – Consultation report 1

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Boardroom of the Airport of Rodrigues
Project area	Plaine Corail
Date	April 3 rd , 2019
Duration	20 minutes
Towns represented	None
Number of persons consulted	5
Group(s) consulted	Exploratory meeting: ARL / SETEC / CYATHEA

A first exploratory and presentation meeting took place on Wednesday, April 3rd, 2019 in the meeting room of the Airport of Rodrigues. The following were present:

Armand Perrine – ARL
Maïlys Delhommeau – SETEC
Frédéric Tranquille – SETEC
Pierre-Yves Fabulet – Cyathea
Stéphane – Cyathea
Luigi Arnaldi and Julien Boule – Insuco

This meeting had been organized on the initiative of Maïlys Delhommeau so that the teams involved in the social and environmental impact assessment (SEIA) could present themselves and explain their area of study and their respective mission(s).

SETEC represents the study office that oversees the SEIA mission and responds directly to the project applicant, ARL.

Cyathea is a study office in La Réunion specialized in the study of the specific flora and fauna of the Indian Ocean. Cyathea is responsible for the environmental impact part (terrestrial fauna and flora) of the impacted area.

Insuco is responsible for the social impact part of the project by proposing a study of the populations directly impacted on the area.

Armand Perrine proposes to visit the various parts of the site of the future construction of the new airport runway, then to go to Port Mathurin to meet the local authorities through the Island Chief Executive, Davis Hee Hong Wye.

14.1.9.2 Annex 2 – Consultation report 2

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Island Chief Executive Office – Port Mathurin
Project area	Plaine Corail
Date	April 3 rd , 2019
Duration	1 hr.
Towns represented	None
Number of persons consulted	6
Group(s) consulted	Exploratory meeting: RRA / ARL / SETEC

A second exploratory and presentation meeting took place on Wednesday, April 3rd, 2019 in the Office of Davis Hee Hong Wye, Island Chief Executive, active authority and representative of the Rodrigues Regional Assembly (RRA). The following were present:

Davis Hee Hong Wye – RRA
Stenny Emilien – RRA
Gail Leong Kye- ARL
Armand Perrine – ARL
Maïlys Delhommeau – SETEC
Frédéric Tranquille – SETEC
Luigi Arnaldi and Julien Boule – Insuco

This meeting had been organised on the initiative of Armand Perrine so that the teams involved in the environmental and social impact assessment (SEIA) could present themselves and explain their field of study and their respective mission(s) to the local authorities of the Rodrigues Regional Assembly.

Maïlys Delhommeau presented the teams involved in the study project commissioned by ARL, the meetings carried out by SETEC in Mauritius prior to the meeting and the management focus of the SEIA study.

Davis Hee Hong Wye explained that the RRA has taken the lead in some field studies, including geological studies with numerous core drillings carried out in the area, but also a relocation plan for people impacted by the project for the construction of the runway.

Davis Hee Hong Wye indicated that negotiations are already very advanced with the inhabitants and users of the impacted area and that in no case will the social impact study conducted by Insuco in the field interfere with the discussions already initiated between the RRA and villagers to avoid a climate of misunderstanding within communities.

Luigi Arnaldi and Julien Boule shared their full understanding of this situation and that it is indeed important not to create unnecessarily tense situations between the different stakeholders in the light of these negotiations already underway. It was then well explained

that the social impact study carried out by Insuco with the villagers and users of the area will be based on a thorough study of the company(ies) directly and indirectly impacted and the current workings of the area in order to propose recommendations through a plan to monitor the economic and social evolution of the populations taken into consideration.

Davis Hee Hong Wye supported Insuco's proposal and rightly encouraged the proposal for recommendations for monitoring the project. He proposed to give the Insuco team all the compiled documents concerning the action plan already initiated and led by the RRA for the relocation of the affected people. These documents will be presented by Stenny Emilien, who will be the main point of contact between RRA and Insuco.

Davis Hee Hong Wye proposed a new meeting via a meeting lunch on Saturday, April 6th, 2019.

14.1.9.3 Annex 3 – Consultation report 3

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	John Resto – La Ferme
Project area	Plaine Corail
Date	April 6 th , 2019
Duration	1 hr.
Towns represented	None
Number of persons consulted	6
Group(s) consulted	Exploratory meeting: RRA / ARL / Deloitte

A third exploratory meeting was organized by the office represented by Davis Hee Hong Wye, *Island Chief Executive*, Saturday, April 6th, 2019 in the form of a *lunch meeting* at John Resto de la Ferme. The following were present:

- Davis Hee Hong Wye – RRA
- Stenny Emilien – RRA
- P. Sooprayen – RRA
- C. Colin - RRA
- Gail Leong Kye- ARL
- Armand Perrine – ARL
- Consultant Maurice – KPMG- Deloitte
- Luigi Arnaldi and Julien Boulle - Insuco

The objective of this meeting was to summarize the information discussed at the previous meeting at the office of Mr. Davis Hee Hong Wye in Port Mathurin to discuss the topics of the consultations brought up and to come together with the RRA and the villagers of Sainte Marie, and then to bring together the different study bodies integrated into the project.

A first point was made on the progress of discussions between the RRA and the impacted inhabitants of the Sainte Marie area. The documents that had been forwarded by Stenny Emilien to Insuco made it possible to better understand these advances in the discussions and to learn about the magnitude of the work that had been done previously by the RRA.

In view of these advances in the discussions, it was reiterated by Insuco that the study carried out will not and would not initially cover the themes of the compensation of the impacted villagers. It is expected that the mission will be an in-depth study of the company(ies) directly

and indirectly impacted and the current operations of the area in order to propose recommendations through a plan to monitor economic and social developments of the populations considered.

The contact with the consultant especially dispatched from Mauritius from the KPMG-Deloitte Office for a socio-economic study related to the project with the aim of clearly delineating the areas of action of the Deloitte and Insuco studies. The Deloitte mission is a general study on the socio-economic aspects generated by the airport project on the whole of Rodrigues Island. The Insuco mission is a social study focusing only on the project's direct impact area. The idea is to ensure that the two studies are not carried out on the same topics and that there is no 'double-work' performed.

Davis Hee Hong Wye indicated that the negotiations are already very advanced with the inhabitants and users of the impacted area and that the next individual meetings will be held on Wednesday, April 10th in Port Mathurin with all the villagers of Sainte Marie concerning the relocation file.

14.1.9.4 Annex 4 – Consultation report 4

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Caverne Bouteille fishing post (Agner Ithier)
Project area	Plaine Corail
Date	April 10 th , 2019
Duration	1 hr.
Towns represented	Plaine Corail
Number of persons consulted	1
Group(s) consulted	Individual consultation: Agner Ithier

This individual consultation following an impromptu visit to the fishing post of Caverne Bouteille. The individual consultation was carried out through discussions with Agner Ithier, 80 years old, head and manager of the fishing post in question.

14.1.9.4.1 Fishing station information

The fishing post was founded and managed by the father of Agner Ithier. The latter took over control following the death of his father.

Agner Ithier holds the drag net fishing licence and defends his fishing position as a privately operated position, compared to the other two fishing posts in the area that are managed primarily by fishermen's cooperatives.

Agner Ithier lives mainly in the fishing post where the boats and equipment are kept.

The "Agner fishery" consists of one head of the fishery, twelve fishermen, one cook and one person for repairs and other works. The latter, more specifically known as "Parts Maker" in Rodrigues, has the main responsibility to repair the nets, when needed.

The fishermen live in the station during weekdays and leave on Fridays in the afternoon to spend the weekend at their homes. Directly, the fishery creates employment for fifteen families in the region.

14.1.9.4.2 Fishing method

In general, fishermen go out to the sea aboard five boats, two to transport and install the drag net and three for "beating". The beating consists in the practice of beating on the water in order to scare the fish that will converge towards the net to be trapped there.

The boats use sails as often as possible to travel in the lagoon and in case of a lull in the wind, three engines are available at the station. Motorboats can tow those that are not motorized.

14.1.9.4.3 Operation of the fishery

The sale of fish is done directly at the fishing post, with the arrival of the buyers (or "*bayans*" in Rodrigues) upon the return of the boats.

Salaries for the week are paid on Saturdays. It should be noted that the wage levels each week are based on the overall productivity of the fishery: the wages obtained for each will therefore depend on the amount of fish caught during the week and experience (a fisherman with more experience will have a higher wage share than apprentices). The salary is therefore set according to a "share system" which was established by Agner Ithier advised by the fishing heads on the boats. Thus, the head of the station and the head of the fishery have one share each. The other fishermen, depending on their experience, have a three-quarters (3/4) share and a (1/2) half-share. The cook and the "net placer" receive a three quarters (3/4) share each.

14.1.9.4.4 General opinion

Mr. Agner agrees with the project to expand the airport in Plaine Corail because he is aware that it will be very important for the country.

However, he is personally affected by the fact that he is subject to displacement. His biggest concern is the fishermen who live in the area and who work for his fishery: they have informed him of their intention to stop fishing in case of displacement at the proposed new site of Pointe Palmiste, because the distance is not viable for them to make a living.

Agner also referred to a potential site in Dans Cocos/Anse Quitar but its only problem is that the area is located just near the Marine Park, known as the SEMPA "South East Marine Protected Areas". He informed us that his proposal was not favourable because activity is not permitted in the marine park.

14.1.9.5 Annex 5 – Consultation report 5

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Village of Sainte-Marie
Project area	Plaine Corail
Date	April 11 th , 2019
Duration	1 hr.
Towns represented	Plaine Corail
Number of persons consulted	1
Group(s) consulted	Individual consultation: Jean Bernard Ste Marie

This individual consultation took place at the residence of Mr. Jean Bernard Ste Marie, 50 years old, resident and spokesperson of the village of Sainte Marie.

14.1.9.5.1 The village of Sainte-Marie

The village of Sainte Marie was founded in 1962 by George Abel STE MARIE, the father of Jean Bernard STE MARIE (called Bernard), who lived in the village of Maréchal. The village of Sainte Marie is not a real one: it is recognized informally by the Regional Assembly of Rodrigues (RRA), but it is not registered as such with the RCSS. Officially, the village of Sainte Marie depends on the neighbouring village of Corail – Anse Quitar.

Bernard was born in 1969 and is now appointed as the spokesperson for the village. He was not elected, simply appointed by a consensus of the village people who are all of the same family. While the villagers went to the meetings of the community centre of Corail – Anse Quitar, they do not go there anymore, because they do not see any interest, judging that the inhabitants of Corail – Anse Quitar act concerning localized actions and do not act on those not concerning them.

14.1.9.5.2 Jean Bernard STE MARIE's activities

Bernard's main activity is livestock breeding, then fishing and finally agriculture.

LIVESTOCK BREEDING

The animals raised by Bernard are cows, small goats, sheep and poultry such as chickens, ducks and guinea fowl. He is not interested in pig farming.

Cattle breeding

In the past, everyone in the village practiced cattle breeding, but during an episode of foot-and-mouth disease in 2016, the herds of most villagers were voluntarily diminished. Today, only Bernard and his cousin Roland still possess a few cows.

The breeding of cows (and other animals in general) on the area remains very extensive. Cows graze freely in the area. There is no particular boundary; they go where they want. In the evening, Bernard goes looking for them and ties them up for the night at the place where he finds them or moves them, if they are too close to a dwelling or a cultivated field. They are released the next morning for a new day of free grazing.

The cows drink freely in the afternoon at a drinking trough built for this purpose near a water desalination unit. The water was previously pumped from a cavern of this karstic area with the name of Caverne Bouteille, which, in fact, gave the name to the area stretching from the desalination unit to the fishing post governed by Mr. Agner Ithier. This cavern is very large and contains large amounts of brackish water. Today, however, the water is no longer pumped by the desalination unit, even if the pipe still exists there. It is from two other places. Bernard does not know the reason for this.

Bernard also mentions that a watering trough had been built closer to the village on the initiative of an independent community project in Sainte Marie about 15 years ago. This was made of fibreglass, powered by a pump connected to Caverne Bouteille. No one took the initiative concerning the maintenance of the pump, which quickly broke down. This project would never have worked.

Bernard has 4 cows: 3 females and a male who was born recently. There is no specific interest in the sex of the animal. Females are considered to be reproductive and are kept for up to 15 - 20 years. Males are kept for 2 1/2 years to 3 years and sold according to their weight. There

is no specific planning or agreement between breeders concerning reproduction. As the animals are free during the day, mating is conducted naturally.

Bovine production is exclusively intended for meat production and the vast majority is destined for export to Mauritius. The sale of animals is constantly carried out on site with the regular visitation of buyers (always Mauritian) possessing a vehicle suitable for their transport. The sales system is most often "in the old fashioned way" by estimating the weight of the animal and agreement on the price between the livestock breeder and buyer. Since the outbreak of foot-and-mouth disease in 2016, a meat-sector-specific weighing system has been established in Port Mathurin. At that time and until the end of 2018, a form of embargo remained in Rodrigues concerning beef. While a large proportion of the cattle herds in Rodrigues was slaughtered at the height of the crisis, only one sales circuit was authorized through the Rodrigues Trading & Marketing Company (RTMC) and the Mauritius Meat Authority (MMA).

Goat and sheep livestock breeding

Most of the livestock breeding of Bernard STE MARIE is in Eau Vert, a large area dedicated to livestock breeding and recognized by the RRA; lying north of the West coast of the island, overlooking Baie des Lascars. He goes there several times per week by motorbike.

The area of Eau Vert brings together a large number of livestock breeders who let their animals graze freely but own a holding pen, if they want to gather their herds, for observation or when it is necessary to provide care. There are no permits specifically issued by the authorities for land use.

Bernard owns there between 30 and 40 small goats and more than 40 sheep. This production is destined for the export of meat to Mauritius. Potential buyers contact Bernard about the availability of animals. He then transfers the desired number of animals to the village of Sainte Marie which keeps them penned up to permit their fattening with the help of specific foods produced in Mauritius, especially during the dry period at the end of the calendar year. Otherwise, the fattening is carried out by distribution of cut grasses.

However, Bernard notes that, according to him, the Eau Vert livestock breeding area will no longer be viable within 3 to 5 years because of the growing invasion of *Acacia nilotica*, locally called *pikan loulou*, an extremely invasive plant that poses real environmental problems on the island. According to Bernard, the methods that RRA could employ will never be sufficient to eradicate the *pikan loulou* of the area given the level of invasion reached today.

Poultry breeding

Poultry breeding remains anecdotal for Bernard. The animals are free to move around his house and they represent a supply of eggs and a little white meat.

For their food, he gives them cooked rice mixed with the food he buys from the neighbouring villages of Cascade Jean-Louis or Grand la Fouche Corail. He refuses to buy industrially manufactured food, indicating his doubts about the ingredients used.

Pig farming

Bernard is not interested in pig farming because it requires a lot of maintenance, especially in terms of cleaning; but also in terms of food.

The pig is the only animal raised in Rodrigues that is slaughtered and consumed on the island, because of a lack of a market on Mauritius because it is less consumed in general. For personal consumption, the pig is slaughtered on the spot, some of the meat or other pieces that are cut

off are sold by the owner of the animal. But pigs can also be sold live to any buyer (of the island) presenting himself and, following the estimation of the price and the agreement, the animals are brought by the buyer in his town to be slaughtered in the nearest slaughterhouse.

FISHING

When the weather is favourable, Bernard who owns a boat, fishes off the coral reef ("off-lagoon"). The type of fishing is bottom-line fishing, permitting him to catch fish such as jack or captain fish.

It is an activity that he rarely practices because the legislation requires him to possess two engines, the maintenance and fuel of which appears to be quite costly.

AGRICULTURE

Bernard operates a fairly large plot (one acre) but it produces little. He cultivates corn and "vine" plants such as giraumon, calabash, watermelon, etc. A part is self-consumed (about one quarter of the production); the rest is for sale but it does not bring him even Rs 1000 per month.

The sheep he keeps penned up near his home during the fattening period to give them the organic matter necessary to operate the field. Jean Bernard never uses a pesticide or synthetic chemical fertilizer.

14.1.9.6 Annex 6 – Consultation report 6

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Village of Sainte-Marie
Project area	Plaine Corail airport area
Date	April 11 th , 2019
Duration	2 hrs.
Towns represented	Sainte Marie
Number of persons consulted	4
Group(s) consulted	Inhabitants of Sainte Marie

14.1.9.6.1 General information (presence and intervention of authorities, etc.)

After being introduced to the inhabitants of Sainte Marie by Arnaud Ste Marie, a young resident of the same village working for the Airport of Rodrigues, an initial consultation took place in the presence of four inhabitants of Sainte Marie: Jean Bernard Ste Marie, George Ste Marie and his wife and André Robinson Ste Marie. The meeting took place in the common room of the home of Jean Bernard Ste Marie.

14.1.9.6.2 Information concerning the project

While rumours were already circulating by word of mouth for a few years, information on the airport expansion project had been formally given around 2010 - 2011 by the government at the time through an invitation to meet for all inhabitants of Sainte Marie at the community centre of the village.

Then the years passed without any other information being given about it.

In August 2018, a large public meeting was held at the Conference Room of the Plaine Corail police station and it brought together the Chief Commissioner and the Commissioners of the

Regional Assembly, the inhabitants of the whole area nearby the Plaine Corail airport and those who had an economic activity there. It was announced at this meeting that the expansion project would now take place and that the start of the work was planned for the end of the year 2019.

14.1.9.6.3 Stakeholder opinion concerning the project

The interviewees fully agree with a development project of such a magnitude for Rodrigues because they cannot be against the advancement of the island.

But they are well aware that they are the ones who are going to be directly affected by this project because they feel that their way of life is specific in comparison to the other citizens of Rodrigues. Their concern is then in relation to the ability to regain a quality of life that is the same as they have today.

14.1.9.6.4 Land use of buildings: environmental and ecosystem issues

No concern has been put forward by the inhabitants regarding the possible impact of future constructions and construction sites on the environment in general or on terrestrial ecosystems with little or no diversity in marine vegetation.

14.1.9.6.5 Land use: physical relocation of dwellings

The inhabitants of Sainte Marie do not express any particular concern about the relocation of their habitat itself. They seem to be confident enough to find a house with, at a minimum, the standards of their current dwellings. Their life "does not come down to four walls and a roof".

The concern is still about the change of lifestyle and the relationship with the new neighbourhood: how will their habits, especially with regard to livestock, be perceived by the current inhabitants of the resettlement area?

In connection with livestock, it is also the access to water that is emphasized. Will the resources be sufficient for all the herds? Will the distances to be travelled to permit the animals to drink not be too significant?

The main identified impact is therefore good for livestock breeding. Practically all the inhabitants of Sainte Marie have livestock and the same holds true for the inhabitants of the town that have been approached for resettlement. A certain amount of pressure from the cattle will be exerted on the grazing areas because the cattle density will inevitably increase in the area.

The expectation of the people consulted is clearly related to the support of the local government for this resettlement, in particular with regard to the addition of point(s) of access to water for livestock breeders' animals.

As the rather free livestock breeding procedure of the inhabitants of Sainte Marie will need to change, they recommend an organisation of animal holding pens to facilitate the management of the herds of each livestock breeder and thus limit the pressure of cattle on all pasture areas. Zoning of these livestock holding pens has been proposed on the periphery of Baie Topaze. And it is in this sense that the support of the Regional Assembly is desired.

14.1.9.6.6 Economic issues (employment, other...)

The clear concern at the level of the economic issues is the decrease in activities that represent the main sources of income of the villagers of Sainte Marie, and in particular that of the livestock breeders.

The grazing areas of the island in general are drastically restricted by the invasion of the surfaces by the invasive plant known as *Acacia nilotica* or *pikan loulou*. In addition, the resettlement of the inhabitants of Sainte Marie in an area already occupied by inhabitants, who are also livestock breeders, will inevitably create pressure on the pastures and consequently all livestock breeders shall be forced to reduce their herds, which will inevitably result in a loss on the incomes for everyone.

It was indicated by the people consulted that the local government must take into consideration that livestock breeding in Rodrigues is one of the major economic pillars of the island and the fact that livestock breeding will be restricted from this point forward must be taken into consideration. There are no large industries developed on the island and economic fallback solutions need to be considered.

Especially for the communities of Plaine Corail, the expansion of the airport will generate new economic activities on the island and in particular in the area. The villagers would therefore like the younger generations to be able to be supported as a priority by being actively involved through the proposal of jobs or similar activities.

14.1.9.6.7 Social impact (demography, migrations)

No specific concern was raised by the people consulted on the demographic impact on the resettlement area, except for that related to livestock breeding. The inhabitants who will be relocated already accept the idea of displacement. If they do not frequently associate with the inhabitants of the area of relocation, they know them and do not raise any concern about the relations of neighbourhood.

14.1.9.6.8 Health and safety: impact of infrastructure (accidents, noise, dust)

For the villagers of Sainte Marie, there is no concern raised with regard to the potential impacts connected with the works and developments connected with the project. On the contrary, they consider that they will even be farther from the airport than they are today and they and their animals will be even less affected.

14.1.9.6.9 Cultural heritage issues (damage, loss, access, degraded environment)

In general, the interviewees did not mention specific sites of worship or sites of a heritage character. Only one person mentioned the presence of a small cave in which he likes to commune with himself, but it is not located directly in the impacted area and access should remain possible.

14.1.9.6.10 Current communication loop with the project

The communication has been regular for a few months but the inhabitants of Sainte Marie believe that they are still unclear about their future. While elements have been put forward by the Regional Assembly, nothing concrete has finally been proposed, especially for the issue of livestock breeding.

14.1.9.6.11 Desired communication loop / proposals for improvements for effective communication

The people consulted insist on the importance of local government to ensure regular communication and support throughout the period necessary for their adaptation.

They fear that the authorities will no longer contact them once the physical relocation is carried out. In this regard, they would like a new point of contact with knowledge of the file to be given to them in order to have "a door on which they can knock" in case of lack of communication with the local government.

14.1.9.7 Annex 7 – Consultation report 7

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Village of Sainte-Marie
Project area	Plaine Corail
Date	April 11 th , 2019
Duration	1 hr.
Towns represented	Plaine Corail
Number of persons consulted	1
Group(s) consulted	Individual consultation: Christian Ste Marie (Guy)

This individual consultation took place at the residence of Mr. Guy Ste Marie, 58 years old, an inhabitant of the village of Sainte Marie.

14.1.9.7.1 The village of Sainte-Marie

The village of Sainte Marie was founded in 1962. The village of Sainte Marie is not a real one: it is recognized informally by the Regional Assembly of Rodrigues (RRA), but it is not registered as such with the RCSS. Officially, the village of Sainte Marie depends on the neighbouring village of Corail – Anse Quitor.

14.1.9.7.2 Activities of Guy STE MARIE

Guy's main activity is fishing and livestock breeding

FISHING

Guy's main economic activity is fishing. Guy learned with the former fishermen of Ste Marie. He owns a boat that he keeps at the "mooring" of Bangélique. This is the third boat he has used for his activities in the sea. His first boat was bought through a loan from the Development Bank of Mauritius. Like him there are eight other fishermen who keep their boat in this "mooring". The other fishermen are Jean-Noel Larcher, Jean Dany Ste Marie, Ludovic Larcher, Antonio Larcher, Fabrice Ste Marie, Harel Ste Marie, Margeot Ste Marie and Ronald Ste Marie.

Guy holds a fisherman's card and he practices fishing in the lagoon and with the "cagier". The "cagiers" are structures placed in the sea with bait inside to attract fish. The structures are removed from the water after some time in order to remove the trapped fish from inside. He has an engine that he uses when the wind is weak. He practices fishing individually because he believes that individual fishermen have more advantages compared to fishermen who operate in cooperatives. One of the advantages mentioned is the freedom of individual fishermen.

In relation to the relocation of the "mooring" at the new site of Le Saline, he confirms that this will have an economic impact on his fishing activity. The Bangélique site is a 5 minute walk from home and at the new resettlement site, the distance will be more. The fishing potential will be less compared to the site he is currently fishing at unless he fishes near the reefs. Another point is the use of a motor more frequently from Le Saline to the current site. Now he mostly uses a sail to go to his fishing site with a fuel cost of Rs 1,200 per year. With the resettlement, it will be necessary to spend Rs 500 on average per week to buy fuel because the distance will be longer.

LIVESTOCK BREEDING

The animals bred by Guy are small goats, laying hens and local hens.

Goat breeding

Guy owns 9 small goats that he feeds in the village of Ste Marie. The animals are kept in holding pens in the evenings and then released in the morning to go grazing.

Poultry breeding

The other important activity of Guy is the care of the laying hens that he keeps in a small hen house. The eggs are picked up daily and their production is 75 eggs daily. He feeds them with food purchased from local retailers and transported in his own vehicle. He manages to sell all the eggs, which are sold at a shop in Plaine Corail and also to the villagers of Ste Marie.

14.1.9.8 Annex 8 – Consultation report 8

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Home of the fishing post manager, Bruno Capdor
Project area	Plaine Corail
Date	April 12 th , 2019
Duration	1 hr.
Towns represented	Plaine Corail
Number of persons consulted	1
Group(s) consulted	Individual consultation: Bruno Capdor

This individual consultation took place following an appointment with Mr. Bruno Capdor, manager of the Bangélique fishing post, who proposed to come and meet at his home.

14.1.9.8.1 Fishing station information

The fishing post was previously managed by Bruno Capdor's father. The latter took over the control and was assisted by his brother Gilles.

Bruno Capdor owns a drag net fishing licence and unlike the fishing post of Mr. Agner Ithier, on the Caverne Bouteille area, the fishing post that he manages works with the title of a fishermen's cooperative. This implies that Bruno Capdor does not own all the boats, other fishermen can bring their boats, but it is not necessarily them who fish.

The "Capdor fishery" consists of one manager of the fishery, twelve fishermen, one cook and one person for repairs and other works.

The fishermen live in the station during weekdays and leave on Fridays in the afternoon to spend the weekend at their homes. Directly, the fishery creates employment for a dozen

families. The fishing post consists of a handful of sheds built with coral blocks and sheet roofs. One of the shelters is specifically for fishing equipment in order to keep the precious nets safe.

14.1.9.8.2 Fishing method

In general, fishermen go out to the sea aboard five boats, two to transport and install the drag net and three for "beating". The beating consists of the practice of hitting on the water in order to scare the fish that will converge towards the net to be trapped there. This type of fishing is the same as described by the head of the other fishery, Agner Ithier.

The boats use sails as often as possible to travel in the lagoon and in case of a lull in the wind, three engines are available at the station. Motorboats can tow those that are not motorized.

14.1.9.8.3 Operation of the fishery

The sale of fish is done directly at the fishing post, with the arrival of the buyers (or "*bayans*" in Rodrigues) upon the return of the boats.

Salaries for the week are paid on Saturdays. It should be noted that the distribution of salaries each week is made differently than in the Ithier fishery: While the allocation also works by system of units, these are defined after the head, Bruno Capdor, has taken out his production costs. Then sharing is done with a larger share for the manager, i.e. 2 shares. The head of the fishery has one share. The other fishermen, depending on their experience, have three-quarter (3/4) share and (1/2) half-share.

14.1.9.8.4 General opinion

Bruno Capdor agrees with the proposed expansion of the airport in Plaine Corail and does not oppose a marked reluctance to the fact that this area is no longer accessible.

According to discussions already held with the Committee of the Regional Assembly of Rodrigues, it is anticipated that it will be compensated for the same infrastructures that it possesses today and only be moved a little further in the Baie Topaze, on the seaside called La Saline. The distance to reach the fishing area is a little longer but Bruno Capdor did not seem very affected.

14.1.9.9 Annex 9 – Consultation report 9

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Village of Plaine Corail
Project area	Plaine Corail
Date	April 12 th , 2019
Duration	1 hr.
Towns represented	Plaine Corail
Number of persons consulted	1
Group(s) consulted	Individual consultation: Richelin Farla

This individual consultation took place at the home of Mr. Richelin Farla, an inhabitant and spokesman of the village of Plaine Corail (the area concerned).

14.1.9.9.1 The village of Plaine Corail

Plaine Corail is the proposed site for the resettlement of the people of the village of Sainte Marie and there are 14 livestock breeders in the region concerned. The people of Plaine Corail are affiliated to the village of Cascade Jean Louis which is duly registered and recognized by the RCSS. The area concerned consists of 8 families.

Richelin was initially a full-time fisherman but since he was employed 15 years ago by "Airport of Rodrigues Ltd" (ARL), he no longer has time to engage in fishing. Fishing was his main source of income followed by agriculture. Previously he lived in another region and then came to settle in Plaine Corail.

14.1.9.9.2 Activities of Richelin FARLA

Richelin's main activity is livestock breeding and farming.

LIVESTOCK BREEDING

The animals bred by Richelin are cows and sheep.

Cattle livestock breeding

Richelin and his wife own cows which they feed in an extensive manner. The cattle are always tied up to avoid physical damage to plantations and other incidents. Cattle breeding is traditionally performed, where even water is transported in buckets to give to the cattle. The tie-up locations of the cattle are changed every day so that they can feed themselves. In comparison to Sainte Marie, cattle are not allowed to graze without supervision.

Sheep breeding

Richelin owns sheep that he feeds on a parcel of land that he contained with fences in order to control access. All his sheep are kept on this same site or the land is divided into two parts, one to keep the beasts and the other intended for grazing. In order to adapt to dry periods when fodder is scarce, Richelin also cultivates fodder plants. At some point, the sheep are released to go grazing in the grass in the vicinity under the supervision of a guard, either Richelin or his wife.

Richelin faces the problem of access to water for livestock breeding and relies on rainwater because the frequency of water distribution on the network is long.

AGRICULTURE

Richelin works on a parcel of land near his house where he cultivates the little Rodrigues pepper (Ti-piment) during the good season, vine plants and also the beans that are very popular on the island with the locals and tourists. He mainly uses natural fertilizers from his sheep breeding, to enrich the land in order to have good harvests.

14.1.9.10 Annex 10 – Consultation report 10

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Village of Sainte-Marie
Project area	Plaine Corail airport area
Date	April 14 th , 2019
Duration	1 hr.

Towns represented	Sainte Marie
Number of persons consulted	9
Group(s) consulted	Inhabitants of Sainte Marie

14.1.9.10.1 General information (presence and intervention of authorities, etc.)

After requesting the presence of the villagers of Sainte Marie the day before for a final consultation following the various interviews and surveys obtained during the previous days, nine villagers gathered in front of the small building acting as the Sainte Marie community centre. The meeting was held at this place and the assembly consisted of five women and four men. As confidence was engendered during the survey period, the consultation took place very easily and all the people were able to speak freely.

14.1.9.10.2 Information concerning the project

While rumours were already circulating by word of mouth for a few years, information on the airport expansion project had been formally given around 2010 - 2011 by the government at the time through an invitation to meet for all inhabitants of Sainte Marie at the community centre of the village.

Then the years passed without any other information being given about it.

In August 2018, a large public meeting was held at the conference room of the Plaine Corail police station and it brought together the Chief Commissioner and the Commissioners of the Regional Assembly, the inhabitants of the whole area nearby the Plaine Corail airport and those who had an economic activity there. It was announced at this meeting that the expansion project would now take place and that the start of the work was planned for the end of the year 2019.

14.1.9.10.3 Stakeholder opinion concerning the project

The interviewees fully agree with a development project of such a magnitude for Rodrigues because they cannot be against the advancement of the island. These are also positive points that have been pointed out initially with regard to the project.

But they are well aware that they are the ones who are going to be directly affected by this project, because they feel that their way of life is specific in comparison to the other citizens of Rodrigues. Their concern is then about changing lifestyles and the ability to reproduce an activity that will provide them with incomes that are equivalent to what they are obtaining today.

14.1.9.10.4 Land use of buildings: environmental and ecosystem issues

No concern has been put forward by the inhabitants regarding the possible impact of future constructions and construction sites on the environment in general or on terrestrial ecosystems with little or no diversity in marine vegetation.

14.1.9.10.5 Land use: physical relocation of dwellings

The inhabitants of Sainte Marie do not express any particular concern about the relocation of their habitat itself. While they are OK with livestock breeding in their habitat and implementing the holding pens for their animals, they express concern at the level of the method of organisation to be established to maintain their livestock breeding activity.

The villagers of Sainte Marie still feel that it will be simpler for them in their daily lives to be closer to the main road.

In connection with livestock breeding, it is also the access to water that is emphasized. Access that will become much more difficult for them because the area is likely to be much more densely populated with animals.

The main identified impact is therefore good for livestock. Practically all the inhabitants of Sainte Marie have livestock and the same holds true for the inhabitants of the town that have been approached for resettlement. A certain amount of pressure from the cattle will be exerted on the grazing areas because the cattle density will inevitably increase in the area.

It was also mentioned that a displacement necessarily implies expenses incurred by domestic equipment that they may not be able to transport (old furniture, etc.) and that this has not been taken into consideration in the discussions already obtained.

The expectation of the people consulted is clearly related to the support of the local government for this resettlement, in particular with regard to the addition of point(s) of access to water for the animals raised.

As the rather free livestock breeding procedure of the inhabitants of Sainte Marie will need to change, they recommend an organisation of animal holding pens to facilitate the management of the herds of each livestock breeder and thus limit the pressure of cattle on all pasture areas. Zoning of these livestock holding pens has been proposed on the periphery of Baie Topaze. And it is in this sense that the support of the Regional Assembly is desired.

The villagers still feel that the future remains unclear to them. If proposals have been made orally, no formal written proposal has yet been reached.

14.1.9.10.6 Economic issues (employment, other...)

The clear concern at the level of the economic issues is the decrease in activities that represent the main sources of income for the villagers of Sainte Marie, and in particular that of the livestock breeders.

The grazing areas of the island in general are drastically restricted by the invasion of the surfaces by the invasive plant known as *Acacia nilotica* or *pikan loulou*. In addition, the resettlement of the inhabitants of Sainte Marie in an area already occupied by inhabitants that are also livestock breeders will inevitably create pressure on the pastures and therefore all livestock breeders must be forced to reduce their livestock, which will inevitably result in a loss on the incomes of all: "we have here a certain capability of 90% to feed our animals, and this may fall to 40%".

In addition, it was mentioned that the fact that the inhabitants are closer to the commercial areas (the shops), their consumption and therefore their expenses could increase.

It was brought up by the people consulted that the local government must take into consideration that the livestock breeding in Rodrigues is one of the major economic pillars of the island and that it must take into consideration the fact that the livestock areas are being

restricted to them now. There are no large industries developed on the island and economic fallback solutions need to be considered.

The expansion of the airport will generate new economic activities on the island and in particular in the area. The villagers would therefore like the younger generations to be able to be supported as a priority by being actively involved through the proposal of jobs or similar activities.

The villagers would like the government to support them by offering facilities (financial or otherwise) to enable them to create their own activities, not simply to give them an unchosen job.

14.1.9.10.7 Social impact (demography, migrations)

No specific concern was raised by the people consulted on the demographic impact on the resettlement area, except for that related to livestock breeding. The inhabitants who will be relocated already accept the idea of displacement. If they do not frequently associate with the inhabitants of the area of relocation, they know them and do not raise any concern about the relations of neighbourhood.

14.1.9.10.8 Health and safety: impact of infrastructure (accidents, noise, dust)

For the villagers of Sainte Marie, there is no concern raised with regard to the potential impacts connected with the works and developments connected with the project. On the contrary, they consider that they will even be farther from the airport than they are today and they and their animals will be even less affected.

14.1.9.10.9 Cultural heritage issues (damage, loss, access, degraded environment)

In general, the interviewees did not mention specific sites of worship or sites of a heritage character. Only one person mentioned the presence of a small cave in which he likes to meet with others, but it is not located directly in the impacted area and access should remain possible.

14.1.9.10.10 Current communication loop with the project

The communication has been regular for a few months but the inhabitants of Sainte Marie believe that they, nevertheless, are still unclear about their future. If elements have been put forward by the Regional Assembly, nothing concrete has finally been proposed, especially for the issue of livestock breeding.

14.1.9.10.11 Desired communication loop / proposals for improvements for effective communication

The people consulted insist on the importance of local government to ensure regular communication and support throughout the period necessary for their adaptation.

They fear that the authorities will no longer contact them once the physical relocation is carried out. In this regard, they would like a new point of contact to know the file to be given to them in order to have "a door to which to knock" in case of lack of communication with the local government. They talk about the idea of having the opportunity to have direct contact with donors, "a contact that will give us the assurance that the direction taken is the right one".

14.1.9.11 Annex 11 – Consultation report 11

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Plaine Corail Village
Project area	Plaine Corail
Date	April 13 th , 2019
Duration	1 hr.
Towns represented	Plaine Corail
Number of persons consulted	20
Group(s) consulted	Inhabitants of Plaine Corail

14.1.9.11.1 General information (presence and intervention of authorities, etc.)

The consultation of the villagers of Plaine Corail was requested the day before on April 12th, 2019. The presence of Mr. Nicolas Volbert, Deputy of the Regional Assembly (opposition party) and resident of Plaine Corail is worth noting. A large proportion of the members of the village were present. While the women were fairly well represented, there were more men in the assembly. The meeting took place in the living room of Mr. Richelin Farla.

14.1.9.11.2 Information concerning the project

The villagers heard about the project of expansion of Plaine Corail Airport mainly through the radio, about two or three years ago.

Nicolas Volbert, in his role as a deputy, claims to have had the news well before and even indicates that it is the political party to which he belongs that originally had the idea of the project to expand the airport runway in 2006 and then that it was put on the agenda in 2010 by the current government.

The villagers regret that no one from the Regional Assembly came directly to inform them of the progress of the project. They are aware, however, that the villagers of Sainte Marie have been approached to settle in their village, having even seen them take some actions with public servants.

14.1.9.11.3 Stakeholder opinion concerning the project:

The positive point that has been highlighted is that there will be development in their town and probably more employment opportunities. The villagers of Plaine Corail hope, however, that these jobs will be offered to them on a priority basis, because of their proximity to the airport area, as many young people in the town are unemployed.

The inhabitants of Plaine Corail are not against the arrival of the inhabitants of Sainte Marie, but it will be necessary to find a good common ground especially for the organisation of livestock breeding in the area.

14.1.9.11.4 Land use of buildings: environmental and ecosystem issues

The issue of the environmental impact related to the construction and construction sites of the project was not brought up or related by the inhabitants.

14.1.9.11.5 Land use: physical relocation of dwellings

With the arrival of new inhabitants in the town, there is a great concern regarding the restriction of the spaces connected with the livestock breeding and thus the potential obligation to reduce their herds to mitigate the pressure on the pasture areas. Most of the villagers of Plaine Corail obtain their financial resources from their livestock breeding activity.

The idea of a change in the current way of life was also brought up by the villagers, but this always in relation to the organisational relations to be established with regard to livestock breeding. There was no objection brought up to the villagers of Sainte Marie.

The impact clearly identified by the villagers only concerns the livestock breeding and restriction of grazing areas. If solutions are not found, young people in the village could easily find themselves without financial resources.

It is proposed by the village assembly that the authorities support the families to establish land parcels with barriers so that everyone can feed their animals in tranquillity without any ambiguity.

14.1.9.11.6 Economic issues (employment, other...)

The villagers of Plaine Corail are aware of the job opportunities that will be created during the implementation of the project and even thereafter, as the area is considered a showcase of Rodrigues. They hope that the people in their village will benefit from these opportunities because of their proximity as most often the people recruited come from rather far away.

The impacts can be equally positive if local residents obtain work through the opportunities that will be created from the airport expansion project.

But the impacts can also be adverse in the event that the inhabitants of the village are not integrated into the project and if they are not supported by the authorities in the management of their livestock.

It is expected that the local authorities and institutions concerned will offer priority recruitment to the inhabitants of nearby towns. It is important to them that their town is really taken into consideration because it represents the first image of Rodrigues that people will have when they arrive.

14.1.9.11.7 Social impact (demography, migrations)

The population of Plaine Corail will increase with the arrival of the people of Sainte Marie and this inspires concerns about the way of life that will change. It is emphasized, however, that it is not a question of the arrival of population in terms of demographics or newcomers that inspires concern but rather the adaptation that will be necessary, especially with regard to the management of livestock breeding.

The identified impacts are very clear. They concern exclusively the livestock and the pressure of the number of animals on the grazing area of the town. It will be necessary to learn to live in a larger community and try to find a cohesion of functioning concerning the issues of land available for livestock breeding.

Once again, social cohesion will be based on the good understanding and functioning of the livestock breeding methods between the families of the town. It is expected that the authorities can position themselves as an arbiter of the situation to allow the creation of planting and livestock rearing spaces that are well marked off.

Moreover, due to the proximity of the airport and thus the "showcase effect" of the town in relation to the arrivals, it is proposed to create a "recreation space" in order to promote the cohesion of the group and possibly attract visitors.

14.1.9.11.8 Health and safety: impact of infrastructure (accidents, noise, dust)

The villagers of Plaine Corail referred to the smells of kerosene and the engine noises of airplanes that the wind brings particularly in the summer and expressed the fear that the arrival of larger aircraft represents a greater nuisance.

The fact that the project entails a construction site and the movement of very large equipment has also been addressed. But this does not represent a very substantial problem, but a temporary inconvenience. The villagers understand that it is necessary to go through this to permit this level of development.

The issue in particular is the smells of kerosene that have been emitted with questions about possible repercussions that this would have on their health, some of them already bringing up the headaches caused by the current planes and the obligation to close the windows.

14.1.9.11.9 Cultural heritage issues (damage, loss, access, degraded environment)

The villagers consulted did not mention specific sites of worship or sites having a heritage character.

14.1.9.11.10 Current communication loop with the project

The villagers of Plaine Corail indicate that they have never been directly contacted by any institution, regretting that no one has come to meet with them yet.

They have heard, however, that the inhabitants of Sainte Marie have received land proposals for their relocation and deplore the fact that no authority has come to consult them to share the situation with them.

14.1.9.11.11 Desired communication loop / proposals for improvements for effective communication

The inhabitants of Plaine Corail propose the creation of a village committee for which spokespersons will be designated who can represent the town during regular meetings with the Regional Assembly and the Airport of Rodrigues during the period necessary for the new way of life created by the project.

14.1.9.12 Annex 12 – Consultation report 12

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Bangélique
Project area	Plaine Corail
Date	April 13 th , 2019

Duration	30 minutes.
Towns represented	Plaine Corail
Number of persons consulted	1
Group(s) consulted	Nicolas Volmally, livestock breeder (non-resident) of the impacted area

This individual consultation took place by chance while passing through the Bangélique area to attend the return of the fish. Mr. Nicolas Volmally was waiting for the return of his herds of cows and sheep to tie them and put them in the structure he occupies for his animals.

14.1.9.12.1 Information on livestock breeding infrastructure

The shed used to pen up the animals is actually an old fishing post, built with coral blocks and a sheet metal roof. Nicolas Volmally, nearly 70 years old, has been coming here since his youth in the Bangélique area and says he comes here, if he can, every day. He is, however, helped by his son Laval, who helps him bring the beasts back when they are too far away.

Nicolas Volmally owns about fifteen cows and forty sheep. As he owns a transport vehicle, he also practices the activity of a *bayan*, a reseller of fish or even octopus caught with a drag net in the area.

14.1.9.12.2 Method of livestock breeding

The method of livestock breeding is very extensive: the animals are kept penned up at night in the huts that are used. Then they are released early in the morning to go to pastures all over the Bangélique strip, wherever they wish to go.

The sale of animals is done like everywhere in Rodrigues with buyers coming directly to the location to agree on a price and take the cattle. These are mainly Mauritians, who are the buyers; the majority of the cattle and sheep are exported standing up by boat to Mauritius.

14.1.9.12.3 General opinion

Nicolas Volmally agrees with the project to expand the airport in Plaine Corail. However, he expresses regret for the loss of the view that he has always known in Bangélique since his early childhood. Nicolas Volmally is a contemplative person.

With regard to his displacement, he knows that he will go to an area he knows well in the Salines because he had worked there during his youth. He does not worry about the possibility of having to reduce his herd in relation to potential pressure on pasture areas after displacement. The number of heads in his herd does not matter to him, as long as he owns a few. The animals are his whole life.

14.1.9.13 Annex 13 – Consultation report 13

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Village of Anse Quitor-Corail
Project area	Plaine Corail
Date	May 3 rd , 2019

Duration	1 hr.
Towns represented	Village of Anse Quitar
Number of persons consulted	3
Group(s) consulted	Inhabitants of Anse Quitar

This community consultation was held at the Anse Quitar-Corail Community Centre, a place where the members of the villages affiliated to the Anse Quitar-Corail village Committee meet. The meeting was held in the presence of the Vice President of the village of Anse Quitar, Mr. Andre, Mr. Marclin, the Sports Manager and also Mr. Jean Ley, the Environment Manager.

14.1.9.13.1 The village of Anse Quitar and the affiliated villages

Anse Quitar-Corail is located near the village of Sainte Marie, but is not directly impacted by the project. The village of Anse Quitar is a group of other small villages that are affiliated such as the village of Sainte Marie, Dans Cocos (also known as Plaine Cocos) and Vangasailles. In general, the entire village has 143 families. The village is duly registered with the RCSS and recognized by the Commissions of the Regional Assembly of Rodrigues. The village Committee, which consists of eleven executive members, is democratically voted on through village elections held every two years.

The Community Centre is the meeting place for activities such as meetings, games and working sessions of community groups including the Women's Association, the Youth Group, the Elderly Persons Group, the Village Committee, as well as other community activities.

14.1.9.13.2 Activities of the Villagers of Anse Quitar-Corail

The main activities of villagers are livestock breeding, agriculture and fishing.

LIVESTOCK BREEDING

The animals bred mainly by the inhabitants of the village are cows, small goats and sheep which are mostly kept at Caverne Bouteille. In Anse Quitar alone, there are ten farmers who have cattle in large numbers. According to the ones present, there are about 250 animals, all included, in the region of Caverne Bouteille. It may be that this number can reach a thousand heads if there is no loss of animals from diseases, bad weather and dog attacks.

Cattle breeding

The inhabitants own cattle, which they always fed in an extensive and traditional way in the region. The cattle are always tied up to avoid physical damage to plantations and other incidents. The tie-up locations of the cattle are changed every day so that they can feed themselves. Just as elaborated on in the other reports, the cattle kept at Caverne Bouteille are free to graze in the area. However, the small livestock breeders who feed the cattle in the village of Anse Quitar (all near their houses) tie up their animals.

Sheep and goat farming

The sheep and small goats are fed in the same way or they are free to graze in the area of Caverne Bouteille. In the evenings, animals are put in holding pens built with coral to protect them from bad weather and predators that cause a lot of damage. Every morning the animals are released and left to graze all day in the area without surveillance. There are even livestock breeders who keep their animals inside the pastures that are fenced by the coral walls. These

animals are kept in these pastures during the day in order to better control them. There are structures in Caverne Bouteille for watering animals.

AGRICULTURE

Farming is also practiced in Anse Quitor-Corail, where people grow mostly corn, vine plants, beans, and other plants that grow well in the region. There are also women who work in the agri-food sector where they transform agricultural products for the production of products highly appreciated by visitors.

14.1.9.13.3 Opinion on the project

Those present heard of the development of this project for the first time in 2006 in public meetings and also heard that the relocation of the inhabitants of the village of Sainte Marie would be carried out in 2019;

Officially, they were not informed by local officers in relation to the project and the related activities.

According to the village officials, the project of expansion of the airport is a good project for the island of Rodrigues in general. This project will have many economic benefits including opportunities for entrepreneurs in the region due to an increase in tourists. The François Lèguât Nature Reserve is already located in the village. This reserve attracts a lot of tourists every year and there is also another attraction in the area, which is Caverne Patate, which is well known.

14.1.9.13.4 Adverse impacts

Although the project has economic benefits, on the other hand there will be problems related to the project. They agree that any good thing comes at a price, but it is necessary to limit the damage as much as possible.

Throughout all the negotiations, they were not informed about their livestock activities at Caverne Bouteille and wondered whether the current livestock breeding area was impacted or not by the project. The main problems discussed are livestock breeding, fishing and the environment.

Livestock breeders that have many animals do not know if the area is impacted and if so, they do not yet know where they will be relocated to continue their livestock breeding. Farmers will be greatly affected because they will have to reduce their number of heads due to the change in livestock breeding techniques. With the current extensive livestock breeding system, the number of heads is far superior compared to the new system advocated. There will not be as much space for holding areas to keep this many animals. There will be an increase in pressure on the soil as there will be a loss of free pasture spaces at Caverne Bouteille. These livestock breeders might suffer an economic shortfall due to the reduction of the free livestock breeding area.

With regard to the environmental aspect, the coral will be damaged as it will be covered by concrete and other materials. So there will be a loss of a historical landscape in the area after this work. This region may lose several historical items, including multiple caves that are interconnected.

With regard to fishing, it will be necessary to relocate the Agner fishery to Dans Cocos or to Les Salines, but it is still safe. They confirm they heard about a possible relocation of the "Agner or Ithier" fishery to Baie du Nord.

The rehabilitation of the inhabitants of the village of Sainte Marie at the new relocation site will be difficult because they are accustomed to a certain way of life and according to them they will need the unwavering assistance of the regional government for social integration and cultural success. The assistance must not only be financial but also a follow-up on the part of the authority concerned such as in relation to the family, agriculture, community development Commissions and so on. The people of Sainte Marie do not yet know what awaits them at the new site. These villagers have a certain way of raising their animals and they will have to change it when they are relocated.

14.1.9.13.5 Recommendations

Generally, the people present during this consultation recognize the importance of this study of social impacts in order to avoid or reduce the damage due to resettlement. Basically they propose the construction of holding pens and pastures for all livestock breeders impacted by this huge project, as well as appropriate monitoring and assistance.

14.1.9.14 Annex 14 – Consultation report 14

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Village of Cascade Jean Louis
Project area	Plaine Corail
Date	May 3 rd , 2019
Duration	1 hr.
Towns represented	Cascade Jean Louis
Number of persons consulted	1
Group(s) consulted	Individual consultation: Tony Louis

This individual consultation took place at the home of Mr. Tony Louis who is the President of the village of Cascade Jean Louis and works as a teacher at a primary school. His wife was also present to give important information in relation to their livestock breeding in Bangélique, an area that is directly impacted.

14.1.9.14.1 The village of Cascade Jean Louis

The village of Cascade Jean Louis also includes the region of Plaine Corail, the resettlement area of the inhabitants of the village of Sainte Marie. As mentioned in other reports, there are 14 livestock breeders in Plaine Corail. Plaine Corail is affiliated with Cascade Jean Louis and they participate together in community activities. Cascade Jean Louis is registered with the RCSS and recognized by the authorities. The village as a whole consists of 175 houses and this number will increase with the arrival of the people of the village of Sainte Marie.

Tony Louis is the President and has been democratically elected by the villagers. The elections are held every two years in order to be able to vote for a team that will work for good progress and the advancement of the village. As in all the other villages, the executive team consists of eleven members with very specific responsibilities.

14.1.9.14.2 Activities of Mrs. Louis and the inhabitants of Cascade Jean Louis

The inhabitants of Cascade Jean Louis work in several spheres of the society of Rodrigues such as civil service, the private sector, as well as small enterprises or informal jobs. The main activities in the region are livestock and agriculture which employ many people.

LIVESTOCK BREEDING

The animals bred mainly by the people of Cascade Jean Louis are sheep and small goats.

Sheep and goat rearing

Mrs. Louis owns 60 small goats in Bangélique which she feeds in an extensive way. Sheep and goat farming is an economic activity that dates back to their grandparents. Their grandparents lived in Bangélique where they practiced livestock breeding and fishing. After her marriage, Mrs. Louis left to live in Cascade Jean Louis. After her move she continued her rearing of small goats in Bangélique where her brothers and cousins also engage in sheep and goat rearing. Sheep and small goats are released in this area where grazing is not controlled. In the evening the animals are kept in a holding pen in order to protect them from bad weather and predators. In the morning, the animals are released where they graze throughout the area. In Bangélique, there is no fenced pasture area.

AGRICULTURE

Mrs. Louis and the other inhabitants are working on parcels of land where they cultivate red beans and shooting plants mainly.

14.1.9.14.3 Opinions on the project

Mr. Louis was informed of the relocation of the inhabitants of the village of Sainte Marie and the livestock breeding holding pens of Bangélique. Although the resettlement village is affiliated with Cascade Jean Louis, there was no information or explanatory meeting with the village President and his executive members.

He knows that the directly impacted inhabitants already have a space for their new houses, but that the only problem is the area of land available for livestock breeding and farming activities.

He confirms that the people of the village of Sainte Marie agree with the relocation to the new site, but that we need to find effective solutions for animals, grazing areas and agriculture.

According to Mr. and Mrs. Louis, the project will be very beneficial for the inhabitants of Cascade Jean Louis, the surrounding villages as well as the country in general. For them, it is a positive project that goes in the right direction.

They brought up that the Agriculture Commission is planning to establish integrated livestock farms where animals will be held in holding pens. The fodder will be cut and taken to feed the animals.

There will be more opportunities for the development of small businesses that will create employment for the inhabitants of the project area. The opportunities mentioned are the creation of jobs during and after the construction of the airport. There will also be opportunities for renting rooms/houses during the period of construction work for foreign workers and/or local residents wishing to stay close to the airport. After the construction, there will be a bigger flow

of tourists on the island and this will create more opportunities for the development of tourist businesses such as small craft shops, restaurants / snack bars and also cottages or guest rooms. The sale of local products will also increase with increasing consumption.

14.1.9.14.4 Adverse Impacts

The main adverse impacts of the project will be economic and cultural losses. According to Mrs. Louis, in the new livestock breeding site, the animals will be kept in holding pens and fed with fodder cut in pastures that the Agriculture Commission will put in place. There is a great risk of losing animals after displacement due to stress and the difficulties of adapting to the new climate and rearing system.

There will be a loss of landscape when this historic livestock breeding area disappears.

14.1.9.14.5 Recommendations

In order to alleviate economic losses, it will be good if livestock breeders can have compensation during the period of re-adaptation of the animals.

As the fishermen are going to be relocated too, there is a need to build shelters to keep the tools, the engines and the drag nets.

All planters and livestock breeders must have access to agricultural technical support from the officers of the Agriculture Commission in order to avoid large losses. This technical support will be very important because livestock breeders will change their livestock breeding technique, which requires more economic and physical effort. Mrs. Louis confirms that she will have to spend more money after the relocation to buy food during the dry season. Currently Mrs. Louis buys very little or almost no food for these animals, because they are free to graze in all the area of Bangélique. As they will soon be in the holding pens all the time, livestock breeders will have to buy food more regularly and this will have a direct impact on the profit margins of the activity.

According to Mr. Louis, it is more than necessary to save or archive photos and videos of all this area that will disappear from our landscape. The impacted area is recognized as a historic coral area for the freebreeding of animals and this does not exist in other parts of the island. As we already know that this historical location will disappear, it is essential to keep memories for generations to come.

With increasing pressure due to an increase in the number of animals in a small area, it may be necessary to propose new economic alternatives. A support plan will be more than necessary for the implementation of new enterprises.

14.1.9.15 Annex 15 – Consultation report 15

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Central Office – Port Mathurin
Project area	Plaine Corail
Date	May 8 th , 2019
Duration	1 hr.
Towns represented	None

Number of persons consulted	6
Group(s) consulted	Exploratory meeting: RRA / ARL / Setec

This exploratory meeting was organized at the request of Maïlys Delhommeau when he first came to Rodrigues at the beginning of April 2019. The objective of this meeting was to make an update on the progress of the project and to meet the heads of the commissions in charge of the project-related files. In fact, the committee appointed by the Regional Assembly met making the connection with the Airport of Rodrigues. This committee is chaired by Davis Hee Hong Wye, *Island Chief Executive*, being present:

- Davis Hee Hong Wye – RRA
- Stenny Emilien – RRA
- P. Sooprayen – RRA
- Armand Perrine – ARL
- Jean Matthieu Ravina – Director of the Agriculture Commission
- Maïlys Delhommeau – Setec
- Frédéric Tranquille – Setec
- Marc Etienne- Setec
- Julien Boule - Insuco

The first point of discussion was to clarify the probable area of encroachment of the new control tower on a habitat defined as critical according to the IFC standards in the initial report. There will be a need to avoid this impact and the construction of the tower will have to be moved a few dozen meters to avoid this impact.

The second point concerned still has a strictly environmental and engineering impact, concerning grottos or caves (Caverne Petit Lac and Caverne Fougères) which can present a problem if they are impacted during the work.

Other points with environmental or geophysical characters were discussed during this meeting.

An interesting bit of information given by Mr. Davis is that the Regional Assembly has set an objective of increasing its tourist attendance to 100,000 tourists in 2025, compared to 70,000 today (out of 110,000 passengers, the remainder being local travellers).

It was also clarified that the capacity of an A321 aircraft is 3 to 4 tonnes of cargo per flight. This pushes Rodrigues to want to export annually about 100 tonnes of fresh octopus, which implies a gain of 30% to 40% concerning this product that is appreciated in Mauritius and La Réunion.

Discussions concerning the social impact were not addressed in this meeting. It was an advantage to meet Mr. Ravina, who gave us information concerning the situation of the livestock breeding in the area of Plaine Corail. An idea is to establish community pasture systems on large areas in the Salines area, in particular.

A meeting was set up for the next day at the Agriculture Commission for more specific agricultural matters.

14.1.9.16 Annex 16 – Consultation report 16

Objective of the consultation	Analysis and planning of stakeholder engagement Airport of Rodrigues Project
Place of consultation	Agriculture Commission - Citronnelle
Project area	Plaine Corail
Date	May 9 th , 2019
Duration	1 hr.
Towns represented	-
Number of persons consulted	2
Group(s) consulted	Consultation with the authorities: Dr. Mathieu Ravina and Mr. Davilla Cupidon

This consultation with the authority responsible for agricultural services took place at the headquarters of the Department of Research and Agricultural Extension Services (RAES) in Citronnelle. The meeting was held in the presence of Dr. Mathieu Ravina, the Manager of RAES and Mr. Davilla Cupidon, the "Agricultural Superintendent".

14.1.9.16.1 The Agriculture Commission

The Agriculture Commission is composed of two departments, the administrative department and the technical department, respectively. The Administration is responsible for the management of the entire agricultural policy of the island and also for the management of the commission. The Administration is under the responsibility of a Department Head ("Departmental Head"), assisted directly by an Administrative Officer and an entire team.

The technical department is directed by a technical manager who manages all the agricultural sections or demonstration centres of the island. The manager is assisted by several scientific officers who work on specific projects.

14.1.9.16.2 RAES activities

The technical centre has several responsibilities including food production, livestock breeding, extension, research, quarantine, control of pests and diseases, beekeeping, statistics, milling of corn, and training among others. Agricultural services are decentralized in other parts of the island, namely Trefles, Port-Sud-Est, La Ferme and Baie aux Huitres. There is a demonstration centre (Plantation) in Mourouk, Grand la Fouche Mangue and Baie aux Huitres. The livestock breeding sections are in St. Gabriel where cattle and small goats are raised, in Baie-Topaze for the raising of pigs and Ile aux Crabes for the production of sheep.

14.1.9.16.3 The discussions

There are currently 22 livestock breeders from neighbouring regions who raise animals throughout the Bangélique and Sainte Marie areas according to a census published on March 13th, 2019 by the Agricultural Services. These livestock breeders originate from Cascade Jean Louis, the village of Sainte Marie, Marechal and Grand la Fouche Corail. The livestock breeders are mainly engaged in the production of small goats and sheep. This situation is due to the fact that beef production is more complicated during the bad seasons and that beef production is less profitable.

According to estimates from the technical centre, the average export of cattle and goats/sheep was 1,900 head and 6,000 head, respectively, before the foot-and-mouth disease outbreak. After this episode and the removal of the export embargo, an increase is anticipated in the export of cattle and small goats/sheep of 2,000 heads and 7,500 heads, respectively, in 2019. The export will depend on the availability of places for the transportation of animals.

The probable areas for the relocation of holding pens and pastures are Les Salines, Pointe L'Herbe, Baie-Topaze and La Boucherie.

The Pointe Corail area will not be impacted by the project, so the livestock breeders of Anse Quitor-Corail will not be involved in the relocation.

For a proper relocation, holding pens located in Bangélique, among others, will either be replaced or rebuilt through government grants. The only major challenge of relocation is the movement of animals from the current site to the new site.

According to these officers, there will be no problem with the availability of fodder if the pasture is put in place and maintained properly.

A problem that can arise is the possible decrease in the number of goats and sheep which is due to the fact that in Bangélique there is more protein fodder (*Acacia*) compared to the new relocation of the holding area. In order to limit this situation, community pastures will be established by the Agriculture Commission for the production of quality local fodder plants. To do this, the commission aims to establish a five hectare pasture (50,000 m²) that will be sufficient to feed the animals.

There will be some worries with the "cut and carry" system. It will be very likely that the extensive system will not be completely eliminated for several reasons such as proper production in terms of quantity and quality. It should be noted that the extensive livestock breeding system in Bangélique and the entire area has been proven in terms of production. The extensive system produces better quality animals. In order to avoid a drastic decrease in quantity and production quality, a semi-intensive livestock breeding system will be encouraged at the new site.

It will be necessary to establish a semi-intensive system with the advent of a regulation that will control the stray animals on the island.

Concerning "Delo Vert", another extensive livestock breeding area, the latter is threatened by a massive invasion of *Acacia nilotica*, a tree known as the "piquant loulou" in Rodrigues. The invasion of *piquant loulou* is caused in part by the overexploitation of pastures. These invasive trees are responsible for reducing the livestock breeding and grazing area in Delo Vert, where there are animals. According to the officers present, during the dry season the livestock breeders are accustomed to moving the animals of Delo Vert to La Boucherie and other areas where fodder is available. In order to counter this problem of the invasion of *Piquant Loulou*, the Environment Committee has a program to eradicate these trees, although this is a big challenge.

This project will have a positive impact on the economy of the Rodrigues agricultural sector. With the advent of large aircraft there will be opportunities for the rapid export of carcasses and other agricultural products. Of the total production of goats and sheep, 90% is exported to Mauritius and only 10% is kept for local consumption. There is a big difference from exporting



and selling locally, because it is not in the culture of the citizens of Rodrigues to eat the meat of sheep and small goats. In Rodrigues, pork is more appreciated, followed by chicken. Exports will increase because the market is not monopolized and there is no fierce competition with the big international producers. There is a free market where small local or Mauritian buyers/brokers can buy animals and export them to Mauritius. These animals are mainly intended for restaurants and hotels.

In relation to food production, the Agriculture Commission will develop a common plantation area with a land parcel for each planter. The parcel area will depend on the area that the planters had in the village of Sainte Marie. As the people of Sainte Marie have a tendency to produce vegetables in an organic way and are joining the objective of the Rodrigues Regional Assembly (RRA) to achieve a 100% organic agriculture by 2030, this will be an encouraging scenario for the setting up of an organic plantation project in the new area. The planters of Sainte Marie have always produced various vegetables using natural fertilizers from their livestock breeding. In order to encourage the adoption of organic farming instead of conventional agriculture, the government intends to make grants and facilities available to these planters who will act as models for the other planters of the island.

Access to water will be taken into consideration, or livestock and plantation production areas will be connected to the water supply system. The commission will exploit the runoff water at La Boucherie. The water will be stored to be distributed to planters and livestock breeders. The government will also encourage the capture of rainwater in the holding pens.

At the present time there is some resistance on the part of those impacted and as soon as the agreement is given, the commission will begin to develop the new relocation site for plantations and livestock breeding areas.



14.2 Questionnaire for socio-economics study

Select the interviewer:
Specify if other
Select the town's name:
Specify if other
Respondent's first name
Respondent's last name
Is the person being interviewed the head of the household?
Respondent's relationship with the head of the household
First names of the head of the household
Family name of the head of the household
Surname of the head of the household
Sex of the head of the household
Approximate age of the head of the household
Marital status of the head of the household
Has the household always lived in Rodrigues?
Since when has the household been installed in the town?
Where does the head of the household originate from?
Specify if other origin
What is the last educational level completed by the head of the household?
Does the head of the household have their PEC?
Does the head of the household have their SC?
Does the head of the household have their HSC?
Diploma obtained
What was the main activity of the head of the household during the past year?
Specify if other
We will now talk about the composition of the household
How many people are currently composing the household, in addition to the head of the household?
For each household member, answer the following questions:
Household member
First name of \$ {rank} th member of the household
Sex of \$ {rank} th member of the household
Who is the \$ {rank} th member of the household for the head of the household?
How old is the \$ {rank} th member of the household
What is the marital status of the \$ {rank} th member of the household
What is the last educational level completed by the \$[rank] th member of the household?
Household member



The number of household members is different from the total.
We will now talk about the access to care for the household.
Is there a household member(s) who suffers from a disability(ies) or chronic disease(s)?
How many people are involved?
What are the handicaps?
How frequently has/have the member(s) of the household gone to Queen Elizabeth Hospital over the last three years?
How frequently has/have the member(s) of the household gone to the Health Centre (La Ferme or Mont-Lubin) over the last three years?
How frequent has/have the member(s) of the household gone to a health clinic over the past three years?
Does the household have access to cultivatable land?
If yes, on what total area?
Surface Area:
Unit:
For these lands, the household is:
Does your household practice farming?
Annual crops
What type(s) of annual crop(s) did the household produce last year?
Specify if other annual crop(s):
Did you get income from these crops last year?
How much in total for the year in Rs?
Perennial crops
What type(s) of perennial crop(s) did the household produce last year?
Specify if other
Did you receive any income from these productions?
Estimate how much in Rs in all of the year
Consumption
Can you estimate the share of self-consumed agricultural production?
If yes, what is the self-consumed share (%)?
Do you own animals (cattle, goats, sheep, pigs, poultry, beehives...)?
In total how much do you have:
Cows:
Sheep/lambs:
Goats:
Poultry:
Pigs:
Hives:
Livestock breeding



Did you receive income from livestock last year?
Can you estimate the total amount for the year?
Does your household practice fishing?
Fishing
Which registration title(s) does the head of the household own?
What type of fishing does the head of the household practice?
Does the head of the household own a boat?
What is the estimated annual income (in Rs) of all fishing activity?
Average current expenditure (Rs) in fishing equipment (nets, repairs...) for the year
We are going to talk about household possessions:
How many does the household have:
Radios:
Televisions:
Refrigerators:
Washing machines:
Generator sets:
Solar panels:
Smartphones:
Beds:
Bicycles:
Motorbikes:
Automobiles:
Trucks:
Boats:
We will now talk about the access to water.
What is the main source of drinking water in the household?
Specify if other
What is the main source of domestic water (toilet, laundry, etc.)?
Specify if other
Does your household have a toilet in your home?
What kind of toilet is it?
What is the main source of electricity in your home?
In what capacity do you occupy your dwelling?
What is the amount (Rs) of your rent per month?
How many rooms do you use in your household (housing, shop, covered kitchen...)?
Out of what material(s) is your dwelling built?
Specify if other material
Does one of the members of the household have a bank account?
Has a member of the household taken out a loan in the last 12 months?
Did one of the men borrow money?



From which institution(s) did the men in the household take out a loan last year?
What was the main reason for this borrowing by the men?
Specify this other reason:
Is it a loan with interest?
Did a woman (women) borrow money?
From which institution(s) did the women in the household take out a loan(s) last year?
What was the main reason for this/these loans taken out by the women?
Specify this other reason:
Is it a loan with interest?
Does your household receive financial assistance from relatives in Mauritius or abroad?
How many money transfers has your household received last year (in Rs)?
We will now talk about household expenses.
What were the two largest household expenditure items in the last month?
Specify if other:
What is your weekly spending amount on average?
We will try together to estimate your income:
What were the main sources of income in the past year for the men in the household?
What were the main sources of income in the past year for the women in the household?
Estimate the annual revenues from: Industrial manufacturing
Estimate the annual revenues from: Crafts
Estimate the annual revenues from: Construction
Estimate the annual revenues from: Commerce
Estimate the annual revenues from: Mechanical activities
Estimate the annual revenues from: Restaurant activities
Estimate the annual revenues from: Tourism
Estimate the annual revenues from: Education
Estimate the annual revenues from: Public service
Estimate the annual revenues from: Social assistance(s)
Estimate the annual revenues from: Other income
Does the head of the household have a phone?
Phone number
Do you have any comments to make concerning this survey?
Comments
Take the GPS coordinates of the yard.
Thank you for your participation!

14.3 Melbourne Airport Emergency Plan





Produced by Melbourne Airport
in the interest of Airport Safety and Security

This document is uncontrolled when printed



Table of Contents

SECTION ONE – INTRODUCTION

1.1	Introduction.....	4
1.2	Rationale.....	4
1.3.	Definitions.....	5

SECTION TWO – SPILL PREVENTION AND RESPONSE

2.1.	Responsibilities.....	6
2.2.	Prevention.....	6
2.3.	Response.....	8
2.4.	Emergency Facilities.....	9
2.5	Effluent Spills.....	10

SECTION THREE – FURTHER ENQUIRIES, CONTACTS AND EMERGENCIES

3.1	Further Enquiries.....	11
3.2	Important contacts.....	11
3.3	EMERGENCIES.....	11

SECTION FOUR – APPENDICES

Appendix 1: Approved Cleaning Materials.....	12
Appendix 2: Emergency Fuel Shut Down and Emergency Shower and Eye Wash locations.....	14

This document is uncontrolled when printed

Section One Introduction

1.1 INTRODUCTION

Any spill has potential to threaten the safety of people and the health of our environment, as well as causing significant disruption to aircraft operations.

The purpose of this policy document is to outline the Melbourne Airport policy in relation to the prevention of spills and detail the correct response procedures. The policy is a part of, and should be read in conjunction with, the Melbourne Airport Airside Conditions of Use.

The policy applies to all aircraft operators, handling agents, refuelling companies, engineers and all other airside tenants and their staff who engage in any activities on the airside at Melbourne Airport. Spill prevention and response procedures outlined in this document are to be followed in conjunction with the Standard Operating Procedures and requirements of the individual organisations.

1.2 RATIONALE

1.2.1 AIM

This Spill Prevention and Response policy has been produced in the interests of safety and security at Melbourne Airport. It details the spill prevention and response rules for operators on the airside.

This policy aims to provide a safe, clean environment for all airside staff, passengers and aircraft and to ensure that the requirements documented in this policy are relevant and capable of practical implementation by all staff.

1.2.2 AUTHORITY

The Spill Prevention and Response policy has been prepared by Australia Pacific Airports (Melbourne) Pty Limited, hereafter referred to as Melbourne Airport.

1.2.3 SCOPE

This document applies to spill prevention and response which all operators and their staff should follow to ensure a safe working environment on the airside at Melbourne Airport.



1.2.4 ALTERATION

Melbourne Airport may vary this Spill Prevention and Response policy at any time. A reference to the Spill Prevention and Response policy shall be a reference to this Policy as distributed, published or otherwise declared to be in force by Melbourne Airport from time to time.

1.2.5 NO DEROGATION

Nothing in the Spill Prevention and Response policy shall derogate from any responsibility otherwise imposed by law, agreement or other policy, procedure or rule imposed by Melbourne Airport with respect to the same or similar subject matter as this policy.

1.3 DEFINITIONS

Prescribed waste:

Is waste that contains contaminants. This may include industrial wastes such oil, fuel, detergents and chemicals. Prescribed waste has the potential to cause serious environmental damage.

Quarantine waste:

Quarantine waste could potentially introduce foreign diseases or pests into Australia. It is usually generated from inbound international aircraft and can include cabin waste, amnesty bins, and seizures from passenger baggage and from imported cargo. This waste may contain quarantinable pests and diseases.

Hazardous waste:

Is effluent waste from aircraft toilet facilities. This waste can contain infectious diseases, especially from international destinations. Effluent and clean effluent must not be touched as individual's may not be adequately immunized.

Section Two Spill Prevention and Response

2.1 RESPONSIBILITIES

Melbourne Airport

Melbourne Airport is responsible for maintaining current spill prevention and response policies and for ensuring all operators and airside personnel are aware of their obligations regarding spill prevention and response.

Melbourne Airport is also responsible for ensuring regular patrols of the apron and movement areas are conducted and for enforcing and encouraging responsible spill prevention and response practices.

Operators

Under this policy all airside operators have a responsibility to prevent spills from occurring on the airside. Aircraft, equipment and plant used on the airside must be maintained in good working order through a dedicated maintenance program in order to minimise spills of fuel or hydraulic oil.

All Airside Personnel

All airside personnel must be trained in the appropriate handling, storage and transportation of materials. Airside personnel must not do anything that is known to cause, or is likely to cause spillage of materials harmful to the environment.

2.2 PREVENTION

Preparation

- Liquid storage tanks must be banded in accordance with the Victorian Dangerous Goods (Storage & Handling) Regulations
- All refuelling vehicles must carry absorbent material at all times, ready for immediate use should a spill occur
- All other airlines and ground handling agents must place yellow Spill Response Kits - to be used for the storage of diatomaceous earth (kitty litter) at strategic locations on the apron. These containers are to be clearly marked with the words **Spill Response Kit** (containers should also have a semi-secured lid to prevent staff using them as general rubbish bins)



The Spill Response Kits must contain:

- Non spark (grain) shovel
- Broom
- Disposable gloves
- Safety goggles
- Coveralls
- Disposable masks
- Waste bag with ties for disposing of contaminated absorbent materials
- Absorbent material, e.g. absorbent sheet, diatomaceous earth (kitty litter), cellulose product
- Panther detergent

Spill response kits must be regularly audited and maintained to ensure kits contain the required contents and are in good condition.

Plans and Procedures

All airside operators must have a plan for dealing with any spill that occurs on the airside. The Spill Response Plan is to outline the following:

- Details of the nominated representative responsible for managing spill prevention and response
- Spill prevention plan
- Spill control and containment measures
- Spill cleanup procedures
- Provisions for the disposal of waste generated during clean up

Training

Operators must ensure that all airside personnel and contractors are aware of the correct response procedures should a spill occur.

A training program covering the following subjects, must be developed by operators

- Environmental awareness
- Spill Prevention
- Spill Response (including containment, clean up, correct disposal procedures and contact numbers)
- Safety hazards

This document is uncontrolled when printed

7

2.3 RESPONSE

The response to a spill should involve four stages – Control, Containment, Contact and Clean.

Control

Immediate action should be taken to secure the site and prevent further material from spilling, but only when it is safe to do so. These actions can include:

- Turning off any ignition sources
- In the case of a punctured drum, the drum can be rolled over so the puncture is on top. This should prevent further spilling of material
- Larger containers which are leaking should be moved quickly to a bunded area
- Valves or pumps should be turned off to stop leaks from pipes and fittings

In all cases personnel must not:

- Attempt to lift heavy objects unassisted
- Expose themselves to toxic material without appropriate protective clothing
- Enter a confined space without appropriate breathing apparatus
- Expose themselves to hazardous situations

Containment

Action should be taken as soon as possible to contain the spill in order to stop the material entering stormwater drains, or contaminating soil.

- Spills should be contained using absorbent material
- Any stormwater drain should be protected first by forming a “dam” of absorbent material around the drain
- Spilled material should then be contained by forming a “dam” of absorbent material around the spill

Contact

As soon as practicable, the spill must be reported to:

- The Senior Airside Safety Officer (Car 2) on 0418 335 985
OR
- The Airport Coordination Centre on 9297 1601, or by pressing the Apron Emergency Call Point button
- The person's immediate Supervisor



Clean

Absorbent materials such as diatomaceous earth or polypropylene are the preferred products for the cleaning of any spills. These products absorb the spilled material leaving no residue and have no detrimental impact on the environment. A list of approved cleaning materials is located in Appendix 1.

In cases of 'heavy oil' spillages it may be necessary to scrub the area of the spill with a light detergent to remove any residue of the product. This residue will also then need to be removed.

Saturated absorbent material should be placed in plastic bags to prevent leaching of the material and then disposed of according to the material spilled as below;

- Prescribed Waste: oil, fuel, detergents, chemicals etc.
- Quarantine Waste: toilet spills, catering spills etc.

The disposal of any waste material must be carried out in accordance with this policy and the Operational Safety Policy – *Airside Waste Management*.

If the operator is either unable to clean the spill, or where clean-up has been attempted and the spill has not been cleaned to the satisfaction of Melbourne Airport, Melbourne Airport will clean the spill and charge the costs to the operator.

The Senior Airside Safety Officer will advise the Supervisor of the Airport Coordination Centre (SACC) when the spill has been cleaned and the bay can be returned to service.

2.4 EMERGENCY FACILITIES

Emergency Fuel Shut Down Buttons

Emergency Fuel Shut Down buttons are located on all aircraft parking bays and on board refuelling vehicles. All airside workers are encouraged to push an Emergency Fuel Shut Down button if they perceive that a genuine risk to the safety of staff, passengers, aircraft, or property exists. The activation of a stop button will shut down all fuel lines to the Airport and it will take a significant time to reactivate refuelling. Locations of Emergency Fuel Shut Down buttons are mapped in Appendix 2.

Emergency Shower and Eye Wash Facilities

Emergency shower and eye wash facilities are provided at various locations on each of the concourses and Southern Apron. These facilities should be used by any airside personnel that come in contact with



hazardous liquids or other material. Locations of the Emergency Showers and Eye Wash stations are mapped in Appendix 2.

Important: Airside personnel who have fuel spilt on their clothing, should not remove the clothing until they are under an emergency deluge shower. Otherwise, static electricity caused by the removal of the clothes, may ignite the fuel.

2.5 EFFLUENT SPILLS

When responding to spills and other hazardous materials, it is important that airside users do not come into contact with the material. Particularly, DO NOT touch effluent or clean effluent as you may not be adequately immunised. Companies are to contact the Airport Coordination Centre or Car 2 to organise for specialised contractors to clean the spill.

The company responsible for the spill is not permitted to conduct their own clean-up of effluent, as a specialized contractor is required.

Section Three Further Enquiries, Contacts and Emergencies

3.1 FURTHER ENQUIRIES

If you have any questions regarding this document, please contact:

Airfield Operations & CASA Manager Policy Coordinator

Melbourne Airport
Locked Bag 16
Tullamarine Victoria 3043
Phone: (613) 9297 1742
Fax: (613) 9297 1995

To obtain copies of the Melbourne Airport Environment Management Plan, please contact:

Environment Manager
Melbourne Airport
Locked Bag 16
Tullamarine Victoria 3043
Phone: (613) 9297 1618
Fax: (613) 9297 1613

3.2 IMPORTANT CONTACTS

Senior Airside Safety Officer (Car 2)

Phone: 0418 335 985

Airport Coordination Centre

Phone: (613) 9297 1813

Aviation Rescue and Fire Fighting (ARFF) Service

Phone: (613) 9286 3199

3.3 EMERGENCIES

In case of emergency contact the Airport Coordination Centre on (613) 9297 1601 or by pressing the Apron Emergency Call Point button.

This document is uncontrolled when printed

Section Four Appendices

Appendix 1: Approved Cleaning Materials

The materials approved by Melbourne Airport for cleanup of fuel and oil spills are as follows:

CELLULOSE PRODUCTS

ZEOLITE & ABSORBENT BOOMS

available from:

Global Spill Control

16 Halsey Road, Airport West, VIC, 3042

Phone: (03) 9335 5366

ABSORBENT W

available from:

Powell Industrial Derrimut (Formally Purple Pig Derrimut)

1/2 Derrimut Dr, Derrimut, Vic, 3030

Phone: (03) 83532835

POLYPROPYLENE ABSORBENT SHEETS

available from:

Global Spill Control

16 Halsey Rd, Airport West, Vic, 3042

Phone: (03) 9335 5366

WOOL ABSORBENT SHEETS

available from:

Global Spill Control

16 Halsey Rd, Airport West, Vic, 3042

Phone: (03) 9335 5366



CLEANING AGENTS – PANTHER LB879 DETERGENT

available from:

Advance Chemicals

4-8 Malton Crt, Altona, Vic, 3018

Phone: (03) 9398 4444 or (03) 9398 4848

NON-SPARK (GRAIN) SHOVELS

available from:

Tullamarine Hardware

197 Melrose Dr, Tullamarine, Vic, 3043

Phone: (03) 9338 2287



Appendix 2: Emergency Fuel Shut Down and Emergency Shower and Eye Wash locations



