# Resource consenting

## Introduction and summary

- The scale and location of the project means it will be a significant resource consenting task.
- TranzRail consents obtained in the mid-late 1990s have fully lapsed but the Port zoning by Marlborough District Council remains.
- The Board of Inquiry process is recommended for consenting a project of this scale.
- The timeframe is two and a half years at the very shortest and potentially up to three and a half years. Enabling legislation would be an option that provides for a more certain duration in timeframe.
- The costs of this approach are included in the development phase cost estimate.

1. This chapter outlines a framework for advancing approval of a new ferry terminal at Clifford Bay under the Resource Management Act 1991 (RMA).

2. Obtaining the necessary RMA approvals will be a complex exercise as the project has a high degree of strategic significance, nationally, regionally and locally.

## Previous consents

3. While resource consents have previously been granted to authorise the project (and designations have been confirmed for associated infrastructure), the resource consents obtained during the 1990s have since lapsed and cannot be relied upon. In addition, the RMA planning and documentation requirements relating to the project area have significantly changed since it was last considered.

4. TranzRail was the applicant for resource consents in the 1990s, but its successor KiwiRail would not be the appropriate applicant for the project now. The government's options for funding the construction and operation of the project, together with the need for the project to accommodate more than one ferry operator, are both relevant to the choice of applicant and procurement objectives and process.

5. The scale of construction, in the coastal marine area, and in a relatively remote part of New Zealand, would demand a high degree of effects management to satisfy RMA and other statutory requirements. This would involve not only a need for high quality technical analysis and design (to avoid, remedy or mitigate adverse effects), but also a process which effectively engages with stakeholders in that analysis and design.

## Co-ordinated approach required

6. Aspects of the project, such as quarries to provide armour rock for the breakwater, are critical. It is recommended these are consented either prior to, or as part of, the project, rather than being left to be sourced from commercial providers, as would be common for other large construction projects.

7. There is a high level of local community interest in the project, including by the Marlborough District Council, and to a lesser extent other councils located in the upper South Island. The Marlborough District Council has a number of roles with respect to port activities, the RMA, and community leadership, all of which would need to be managed to allow the project consenting process to proceed efficiently and effectively.

8. Active engagement in RMA processes from well-resourced political, environmental, community and other interest groups should be expected. This is due to the very high profile of the project, how it sits with relevant environmental, economic and other issues, the scale of its construction impacts, its effects on regional development, and its consequences for transportation regionally and nationally. Those challenges are likely regardless of the quality of pre-RMA consultation or the general level of wider national support for the project.

9. Because of these significant consenting challenges, a considered, transparent and co-ordinated approach to consenting the project is recommended. This particularly includes:

    - project leadership, management capability and resources
    - consultation and engagement, including with affected communities
    - project design, effects analysis and effects management
    - the hearing of applications

## Planning environment

10. The project applicant, should maintain regular contact with planning staff of Marlborough District Council to ensure that information on whether the port zone or quarrying rules are intended to be altered as part of the Wairau Awatere Resource Management Plan (RMP) review. It is also to avoid complications arising from the timing of the RMP review for the securing of RMA approvals for the project.

11. In addition to the current input to the informal pre-notification process underway, the project applicant should be prepared, if necessary, to make a submission on the RMP (in the event of any relevant RMP review process). Formal public notification is anticipated at the earliest in the last quarter of 2013 (and more likely in 2014). A submission could be needed both to defend the retention of the port zone and (potentially) to make any prudent adjustments to it to ensure it will be suitable in its size, shape, and general provision for the project.

12. Resource consents should be sought for all aspects of the construction and operation of the project (neither designations nor plan changes are warranted, having regard to the current RMP). Specifically, in addition to the port itself, the application(s) would

likely need to encompass quarrying of rock for use in the reclamation and the breakwater, the reclamation itself, and various discharges.

13. Well in advance of lodgement of the application(s), protocols (such as by Memoranda of Understanding) should be reached with:

    - network utilities which will be responsible for infrastructure connecting to the project (e.g. road, rail, electricity), so that any RMA applications they would have to make are properly coordinated
    - Marlborough District Council as to protocols to be followed in community engagement and consultation, and social and economic impact assessments, and the choice of consenting track (Environmental Protection Authority Board of Inquiry (BOI) being the recommended option)
    - the Department of Conservation regarding processes for engagement during technical assessments pertaining to coastal, biodiversity and conservation estate statutory responsibilities
    - Tangata whenua, as to processes for engagement in the undertaking of cultural impact assessment

14. RMA steps can either be undertaken by the NZTA or the Ministry of Transport (at least prior to any legal entity being established for the construction and/or operation of the project). NZTA or the Ministry could be named as the consent applicant if the government seeks to retain overall responsibility and control of the project (or if that legal entity not be formed before the application is lodged). Otherwise, the applicant(s) could include any such entity. Should it be desirable to do so, the responsibilities for holding and/or complying with consents could be transferred to the responsible entity in due course (in those circumstances, consents should be sought on a basis that facilitates such transfer occurring).

15. Fresh resource consent applications supported by fresh technical and other expert assessments and a comprehensive Assessment of Environmental Effects (AEE), will need to be prepared. Some of TranzRail's technical reports will likely be of some value, but only as background reference materials for the relevant experts who are appointed for the project. New assessments would also be required to support new aspects of the project (e.g. proposed quarries which are different from those proposed by TranzRail).

16. Before technical work in support of the application is commenced, a full planning assessment should be undertaken so as to confirm the resource consents required, and an optimal design approach to the consent application (covering, for instance, approaches to the use of management plans for effects management versus other options).

17. Some of the important technical and other expert assessments needed for the AEE will take significant time to complete, due to the need to undertake baseline assessment, modelling and data collection. These include:

    - social and economic impact assessments, which will need to be repeated given the period of time since they were last assessed. These assessments should be integrated with public and stakeholder consultation from an early stage

- coastal processes, impacts within the marine environment, erosion, benthic and related ecology studies, fishing and marine farming, navigation
- traffic and noise modelling and assessment

## Assessment of effects

18. An AEE will be prepared in support of the applications for resource consents for the project. The likely contents of the AEE will be:

- Introduction
- Background to the project
- The approvals sought for the project
- RMA statutory considerations (this will include consideration of statutory documents as required under the RMA, and the main statutory considerations or legal tests of relevance to the project)
- Other relevant approvals required (ie. non-RMA statutory approvals)
- Description of the environment
- Operation of the project
- Construction of the project
- Consultation and engagement (with stakeholders and the community)
- Assessment methodology
- Summaries of methodology and findings of technical work undertaken in support of the project (possibly including the effects of the quarry), this may include:
    - Economic effects
    - Social effects
    - Traffic and transport
    - Coastal processes
    - Oceanography
    - Coastal water quality
    - Sediment and plume effects
    - Ecology (terrestrial, coastal and marine)
    - Climate change
    - Geo ogy and seismicity
    - Groundwater
    - Stormwater and hydrology
    - Archaeology
    - Tangata Whenua and cultural heritage
- Environmental management and monitoring
- Proposed conditions of consents
- Statutory assessment (i.e. providing an overall assessment of the project against the statutory considerations set out earlier in the AEE)

## Consenting path and timeline

19. The Environmental Protection Authority Board of Inquiry consenting track is considered to be the most suitable choice for the project (in preference to Environment Court "direct referral" and traditional "two step" consenting (Council, Environment Court) because the project would meet the criteria for national significance and it has a defined timeframe for processing.

20. The project timeline is estimated to take three and a half to four years from the planning assessment stage until the BOI releases its decision on the project. Scope exists for a more aggressive programme to deliver within two and a half years. The BOI consenting road map with milestones is shown at the end of this chapter.

21. Critical to achieving the two and a half year timeline will be satisfactory completion of baseline surveys and environmental evaluations. The shortened programme raises risks for the application process that are not able to be fully assessed until confirmation is obtained from specialists as to minimum acceptable times for completing surveys and environmental evaluations.

22. The lower risk timeline includes an initial 24-month period to enable baseline surveys and technical assessment and analysis to be undertaken and a further four to six months for the AEE and consent applications to be completed. Within the three and a half to four year timeline, these steps have the greatest capacity for timesaving.

23. The two and a half year programme would rely on all environmental specialists being able to be satisfied that 13 months was professionally acceptable for the purposes of refreshing previous environmental survey data and evaluations. The shorter programme also relies on the AEE and consent applications being completed within three to four months. A programme such as this needs to be incentivised to ensure delivery to timeframes and an appropriate procurement model considered for this.

24. A consenting approach mid-way between the more aggressive and the lower risk timeline is reflected in the Development Phase Programme chapter.

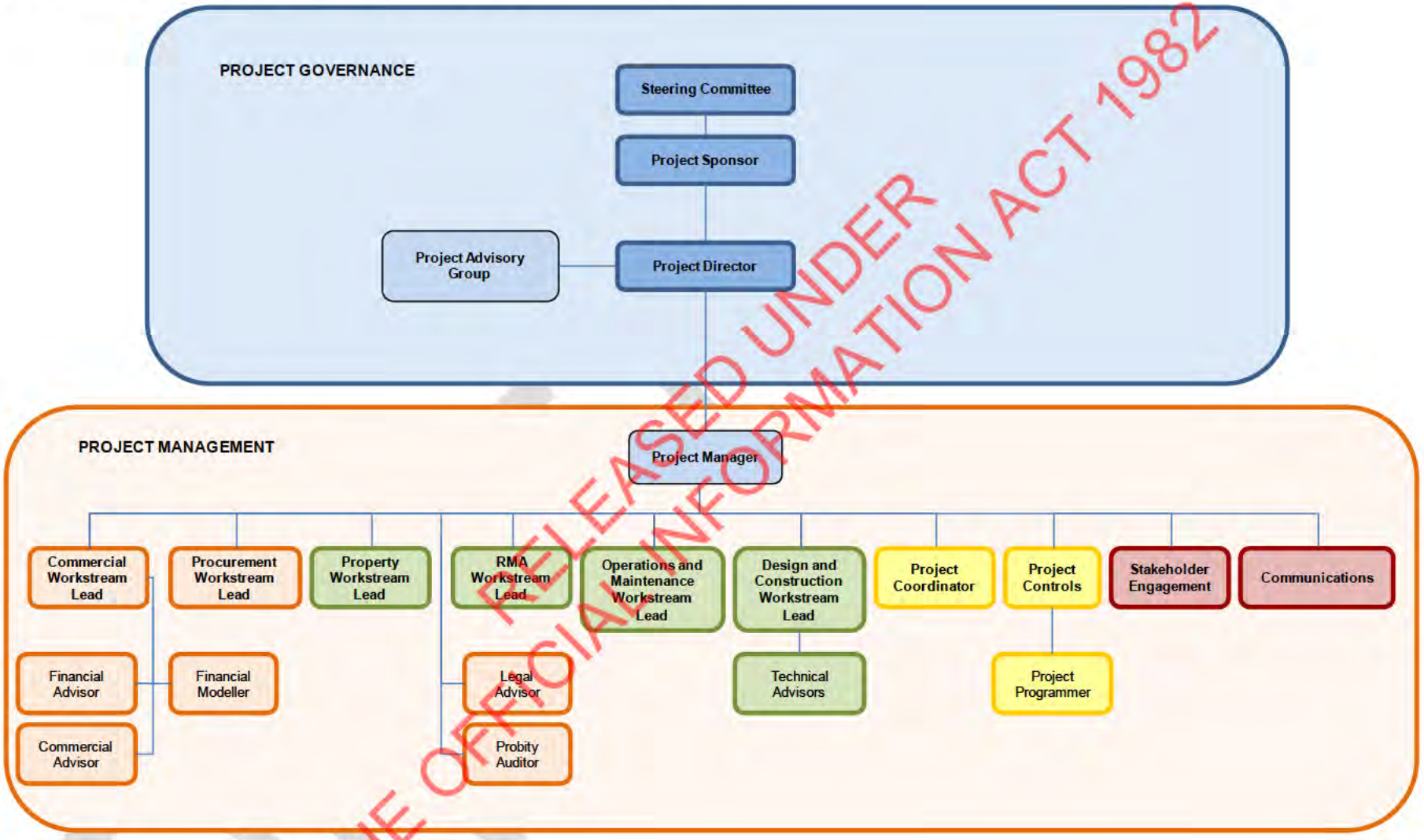
# Project management and governance

## Introduction and summary

- If the Clifford Bay project proceeds to the next stage, a project team will need to be formed to address the key workstreams outlined in the chapters on procurement, land access, resource consenting, and stakeholder enegagment. A strong governance function would be required to oversee and support this team.
- Governance arrangements would be driven by the Steering Committee, Project Sponsor and the Project Director. Management arrangements and activities would be driven by the Project Manager and the various workstream leads.
- The cost of this approach is included in the development phase cost estimate.

1. An indicative project organisation structure for the development phase is shown on the following page.

**Figure 22: Indicative project organisation structure for the development phase**



# Project governance

### Steering Committee

2. The Steering Committee would report directly to the Minister(s) and would be responsible for directing the development of the project and dealing with key issues.

### Project Sponsor

3. The Project Sponsor would be responsible for:

    - ultimate authority and responsibility for the project
    - approving changes to scope, schedule, budget and quality
    - escalating and championing recommendations to the Steering Committee
    - providing policy guidance to the Project Director
    - endorsing the Project Management Plan to confirm that project scope and deliverables are correct
    - reviewing progress and providing advice on resolution of issues
    - supporting the Project Director
    - resolving issues beyond the Project Director's authority

### Project Director

4. The Project Director would report to the Project Sponsor. Responsibilities include:

    - the successful delivery of the project scope as defined within the Project Management Plan or as varied
    - providing overall project management direction including management of project variations and overall project planning
    - providing budgetary and financial control for the project
    - providing quality assurance
    - reviewing and actively managing project risks
    - conducting project meetings, compiling and distributing minutes and other project communication documents
    - stakeholder management and communications oversight

### Project Advisory Group

5. The role of the Advisory Group would be to advise the Project Director on international best practice in regard to the development of the project, particularly with respect to critical risks.

# Project team

6. While the organisational structure shows functional reporting lines, these individual functions would work as a fully integrated team with clearly identifiable leadership for technical areas.

**Project Manager**

7. The Project Manager would report to the Project Director. Responsibilities include:

    - conducting resource allocation and managing the project team
    - to negotiate commission and manage, with the assistance of workstream leads the necessary team of advisors
    - to manage the project risk management process and Risk Management Plan, commission the support required and implement the process
    - to support the Project Director in overall project management, as required
    - to keep communications and stakeholder engagement informed of activities and any potential or emerging communications risks
    - to keep Project Controller informed of activities to ensure that they are recorded in the integrated programme

**Commercial Workstream Lead**

8. This role would report to the Project Manager. Responsibilities include:

    - leading further negotiations with ferry operators
    - leading provision of commercial advice to the project team
    - leading client commercial and financial advice related to project delivery, including development of contract, to financial close
    - keeping Communications and Stakeholder Engagement Lead informed of activities and any potential or emerging communications risks

**Procurement Workstream Lead**

9. The Procurement Workstream Lead would support the Project Director and Project Manager. Responsibilities include:

    - advising the Project Director on procurement strategies to deliver project requirements
    - assisting the Project Director in all facets of the procurement process to reach satisfactory financial close
    - keeping the Project Director informed of any identified potential or emerging risks
    - keeping communications and stakeholder engagement informed of activities and any potential or emerging communications risks

**Property and Land Access Workstream Lead**

10. The Property Workstream Lead would support the Project Manager. Responsibilities include:

    - securing of required property and property rights required for the project in a timescale consistent with the programme for letting the project contract
    - arranging land entry agreements for investigations or other site visits

- keeping the Project Manager and communications and stakeholder engagement informed of all property related risks and issues

**RMA Workstream Lead**

11. The RMA Workstream Lead would report to the Project Manager. Responsibilities include:

- leading resource consents work
- leading client planning and some environmental compliance advice
- keeping Communications and Stakeholder Engagement informed of activities and any potential or emerging communications risks.

**Operations & Maintenance Workstream Lead**

12. The Operations & Maintenance Workstream Lead would report to the Project Manager. Responsibilities include:

- leading client maintenance and operations advice
- maintaining awareness of ferry operator user requirements
- supporting the Project Manager in overall project management, as required
- keeping Communications and Stakeholder Engagement Lead informed of activities and any potential or emerging communications risks
- keeping Project Controller informed of activities to ensure that they are recorded in the integrated programme

**Design & Construct Workstream Lead**

13. The Design and Construct Workstream Lead would report to the Project Manager. Responsibilities include:

- leading client engineering and some environmental advice
- to negotiate, commission and manage, with the assistance of Project Controller, the Technical Advisor work packages
- to jointly manage the project risk management process and Risk Management Plan
- to support the Project Manager in overall project management, as required
- keeping Communications and Stakeholder Engagement Lead informed of activities and any potential or emerging communications risks
- keeping Project Controller informed of activities to ensure that they are recorded in the integrated programme

**Project Controls**

14. This role would support the Project Manager. Responsibilities include:

- developing and maintain project budgets including financial control
- provide regular financial updates (actual, baseline and forecast) to the Project Manager

- managing the project risk management process and Risk Management Plan, commission the support required and implement the process
- developing and ensure compliance with internal control procedures
- supporting the Project Manager in overall project management, as required
- administering all contracts let by project Team
- keeping the Project Manager informed of any identified potential or emerging risks
- keeping Communications and Stakeholder Engagement Lead informed of activities and any potential or emerging communications risks
- to develop and maintain a programme able to provide the programme outputs required for programme management and reporting purposes
- reporting to the Project Manager on programme risks and on mitigation activity progress and effects

**Communications & Stakeholder engagement lead**

15. This role would be split into two; a communications role and a stakeholder engagement role. Responsibilities include:

- analysing the feedback obtained from consultation and recommend any alterations that need to be investigated for inclusion in the project design to the Project Manager
- keeping Project Manager informed of any identified potential or emerging risks
- managing all Official Information Act requests and other external reports and responses
- maintaining a communications log detailing all queries received, responses given and any items being processed
- setting up and managing all external stakeholder liaison activities, including engagement with local communities
- actively engaging with team members to understand and advise on treatment of any potential communications risks

## Budget

16. An indicative budget for the necessary project management and governance structure has been included in the development phase cost estimate.

# Development phase programme summary

## Programme and budget

1. The preceding four chapters cover procurement, land access, resource consenting, and project management/governance. In aggregate, these activities are all an integrated part of the pre-construction programme necessary to guide Clifford Bay successfully to a commitment decision in around 2018. They provide a description of the general approach to secure project land and land use rights, the consents/approvals necessary for the project, and the structural and procurement approach that would take the project to market and successful operation.

2. The government role and procurement chapters have outlined the investigation's view that for the project to successfully engage with private sector funding and capability, the government has a key sponsorship role in these areas if it wishes to proceed.

3. The high level strategy and planning work undertaken in each area has been extended into a summary integrated project programme and budget for the next phase of the project. It is suggested that this next phase be described as the "project development" phase.

4. The key resourcing decisions for the government if it wishes to proceed to the project development stage follow.

    - Establishment of a fit-for-purpose project team in early 2014 to develop detailed planning in each of these areas. This team would logically be domiciled in an organisation with core competencies in large civil project development.
    - Establishment of appropriate terms of reference, delegated authority and governance oversight of that team.
    - An appropriation of $23.2 million allocated to the project over FY14-18 for project development.
    - A contingency allowance of $11.1 million earmarked over FY14-18 to secure land ownership and access rights for the project (to be fully appropriated and adjusted if necessary in 2014 once detailed valuation and acquisition planning had been completed strategies development).

5. The high level programme and phased budget are shown below.

**Figure 23: Clifford Bay project development phase programme (integrating key consenting and procurement activities)**

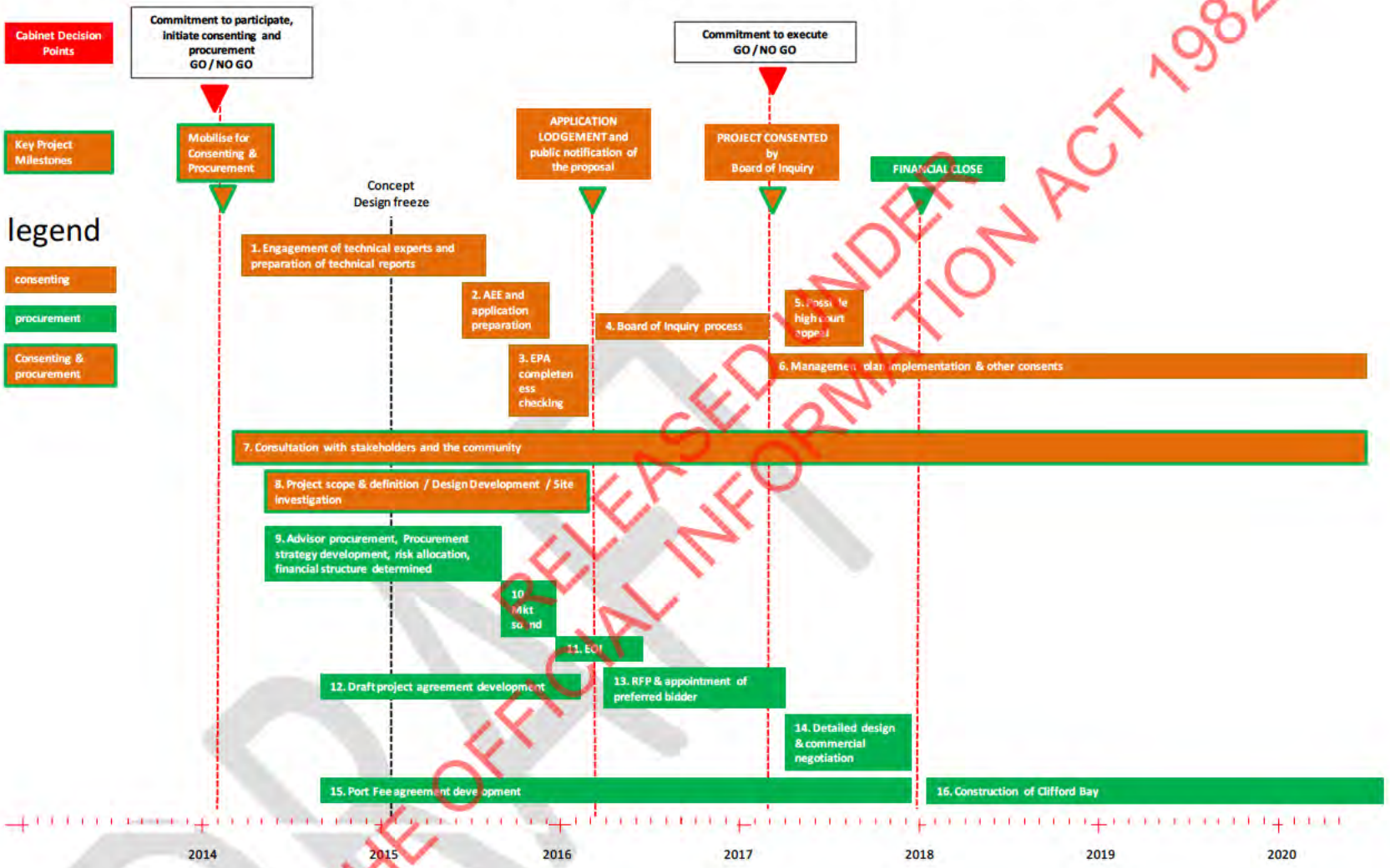


**Table 36: Clifford Bay project development phase budget (integrating key consenting, procurement, and land securing activities)**

| Preconstruction Cost Estimate | Total | | FY14 | FY15 | FY16 | FY17 | FY18 |
|---|---|---|---|---|---|---|---|
| 1. Engagement of technical experts and preparation of technical reports | 3,404 | | 801 | 2,403 | 200 | - | - |
| 2. AEE and application preparation | 2,114 | | - | 352 | 1,761 | - | - |
| 3. EPA completeness checking | 667 | | - | - | 667 | - | - |
| 4. Board of Inquiry process | 1,776 | consent | - | - | 592 | 1,184 | - |
| 5. Possible high court appeal | not budgeted | | - | - | - | - | - |
| 6. Management plan implementation & other consents | incl in construction | | - | - | - | - | - |
| 7. Consultation with stakeholders and the community | 1,785 | | 155 | 466 | 466 | 466 | 233 |
| 8. Project scope & definition / Design development / Site investigation | 2,000 | joint | 182 | 1,091 | 727 | - | - |
| 9. Advisory procurement, Procurement strategy development, determination of risk allocation approach and financial structure | 2,353 | | 294 | 1,765 | 294 | - | - |
| 10. Market sounding | in team costs | | - | - | - | - | - |
| 11. Preparation and running EOI process | 396 | | - | - | 396 | - | - |
| 12. Draft main project agreement development | 700 | procure | - | 412 | 288 | - | - |
| 13. Preparation for and running of RFP process, and appointment of preferred bidder | 4,828 | | - | - | 1,207 | 3,621 | - |
| 14. Detailed design & commercial negotiation with preferred bidder | 2,448 | | - | - | - | 918 | 1,530 |
| 15. Port Fee agreement development with Ferry Operators | 700 | | - | 200 | 500 | - | - |
| **Total preconstruction excluding land** | **23,169** | | **1,432** | **6,688** | **7,099** | **6,188** | **1,762** |
| secure land access | 11,106 | | 278 | 1,111 | 1,111 | 1,111 | 7,497 |
| **Total preconstruction including land** | **34,275** | | **1,710** | **7,798** | **8,210** | **7,298** | **9,259** |

Note that line item numbering allows cross-referencing to the programme view on the previous page.

# Risks

## Introduction and summary

- This section examines key risks in two areas: Risks to commercial viability and risks to construction and operation.
- A number of generic land access and consenting risks exist in the development phase, and these have generic and typical mitigation strategies. Of those risks specific to Clifford Bay, the most important to fully define and appropriately mitigate as early as possible in the development phase relate to Picton transition, operator commitment, and procurement (in the context of the government role and the maximum government appetite for direct investment and ownership of freight volume risk).
- Assuming a decision is taken to enter the development phase, the project should not move into procurement until ferry operator commitment is firm and Picton transition risk defined and mitigated.
- The project should not be committed past the development phase if the procurement process fails to deliver a result inside the government's appetite for direct investment and risk.
- This means the primary value at risk for the government if it decides to proceed to the development stage is the development phase budget.
- Overall, no fatal flaws have been identified in the high level review of construction and operational aspects which would materially impact on the Clifford bay site being an appropriate location for the South Island ferry terminal.



## Key risks to construction and operation

1. Although the primary focus of the investigation has been on commercial viability, the investigation has undertaken a high level review of keys risks and issues relating to the construction and operation of Clifford Bay. A series of specific risks and issues have been examined that could impact on the ability to predict the cost of the facility to reasonable confidence levels and for it to perform to expectation and agreed service levels given the design vessel and climatic conditions. The objective of this review has not been to test for commercial or engineering optimisation but to check for fatal flaws in the ability to build or operate it.

2. In most cases this has involved a review of existing intellectual property overlaid with the implication of more recent information, events and

development in user functional requirements. This high level review is in Appendix 1.

3. The main risk examined around construction is availability of construction material for the breakwater. All four quarries examined as part of this preliminary construction risk assessment are expected to be able to provide rock of required durability and quantity up to 1700kg (subject to consentability). However the larger rock (1.7-5 tonnes) appears more difficult to source.

4. Alternative armouring solutions have been identified that would remove the need for the 1.7 to 5 tonne rock at a small incremental cost (1% of expected project cost), at a higher confidence level, and able to be accommodated within the contingency allowance of the project. This is based on high level assessment and requires more detailed design should this option be required.

5. Further investigation and analysis of ship manoeuvring and stability needs to be undertaken to support the proposed port and terminal development, and in particular to reflect current assumptions and base data. This work is unlikely to result in changes to the project to such an extent that it will significantly affect the vessel operations, port development and project feasibility. This will need to be undertaken to support further planning and resource consenting phases.

6. While the seismic hazard to the proposed Clifford Bay site is not expected to change as a result of recent events it is recommended that as the project progresses ongoing dialogue be maintained with GNS and an update of the previous seismic study be completed if deemed necessary to inform the design phase.

## Key risks to commercial viability

7. The following table looks at those risks that impact the potential viability of Port-Co. It looks at the way they can be allocated and managed, and the way they therefore impact on the commercial objectives of the participants. The risks separate into clusters that impact on the pre-conditions for project commitment in the development phase, the construction phase, and the operating phase.



**Table 37: Risks and their mitigation strategies**

| Development phase key risks | Description | Mitigation |
|---|---|---|
| Land access | Land required for Clifford Bay construction and operation cannot be secured on | Secure core land requirements before entering resource consent hearing process.<br><br>KiwiRail owns most of the required core project land and has agreed transaction protocols. |

| | | |
|---|---|---|
| | acceptable commercial terms. | Department of Conservation landswap template from late 90s exists.<br><br>Terminate development phase if project land cannot be secured on acceptable terms. |
| Project approvals | Project approvals required for Clifford Bay construction and operation cannot be secured on acceptable commercial terms. | Secure cooperation agreements using effects-based mitigation early in the process with adjacent landowners and commercial operators.<br><br>Establish high quality internal team and secure tier 1 advisors early.<br><br>Adopt a consenting strategy that maximises focus on required outcomes and provides maximium freedoms on mitigation method and approach.<br><br>Use a planning process with strong track record of predictability and performance to statutory timeframes to improve confidence levels.<br><br>Terminate development phase if project approvals cannot be secured on acceptable terms. |
| Procurement | There is a lack of value for money/risk competitive tension and/or capability offered by the market. | Communicate procurement process and government role clearly from the outset. Provide selected government risk backstops around counterparty and freight volume risk.<br><br>Establish high quality internal team and secure tier 1 advisors early.<br><br>Facilitate involvement in the consenting/approvals process to minimise exposure to rework and delay once final approvals are granted.<br><br>Terminate development phase if procurement outcome incompatible with government appetite for investment and risk. |
| Cost or risk creep in government role | Government direct investment requirement and/or risk participation is higher than expected. | Clearly establish maximum appetite levels for key elements of the government role early in the development phase. Ensure these are actively monitored and used as trigger points for re-evaluation.<br><br>Rigorously model the expected value and distribution of freight volume risk; Ensure baseline freight volume growth assumption is biased conservatively.<br><br>Use the procurement process to discover risk pricing options and allocate risks efficiently. Create a clear distinction between construction and operation risks, and freight volume risk. Allocate the former to constructors and operators.<br><br>Do not commit to construction phase unless contract is awarded at an overall value inside government appetite.<br><br>Terminate development phase if procurement outcome incompatible with government appetite for investment and risk. |
| Ferry operator committment | Ferry operators are not fully committed to Clifford Bay, undermining government planning confidence. | Ensure port fee agreements are locked down subject only to project specific conditions precedent before issuing EOI.<br><br>Pay particular attention to maintenance of competitive neutrality and seek to move operators as near their indifference point as possible to minimise distortions to the competitive environment and public wealth transfer to them.<br><br>Ensure risks are managed between operator and contractor so no unplanned residual risk spills over to the government. |
| Picton | Monopoly position results in ferry | In the design of the development phase programme recognise that this risk could impact fundamentally on the ability of the existing |

| | | |
|---|---|---|
| transition | operators facing commercially unacceptable conditions in the transition from Picton. | ferry operators to participate in Clifford Bay.<br><br>Ensure Port Marlborough position with KiwiRail and Strait Shipping does not breach competition regulatory or legal requirements.<br><br>Ensure key transition issues with existing operators and Port Marlborough are resolved before issuing an EOI. This will limit sunk costs and reputational damage to the Crown in the event of process failure.<br><br>Be prepared to consider tripartite commercial discussions facilitated by the Crown if operators and Port Marlborough cannot resolve.<br><br>Ensure adequate contingency plans exist around late Clifford Bay commissioning. |
| **Construction phase key risks** | **Description** | **Mitigation** |
| Time, cost & quality outcomes | Key time, cost and quality objectives not met during construction. | Contractor's risk.<br><br>Establish clear accountability and risk transfer to the contractor in project agreement, and through ongoing best practice project controls and management.<br><br>Foster a culture of innovation, learning and adaptation, and rapport so good ideas and improvements get implemented for mutual benefit.<br><br>Ensure a clean risk handshake between operator and contractor exists so no unplanned residual risk spills over to the government.<br><br>Have tight legally binding definition and control around preconditions and payment of government contribution to construction or operation. |
| Health and safety | Serious harm or fatality during construction. | Require evidence of best practice H&S management in procurement, and weight contract award decisions accordingly. Audit compliance with H&S policy. |
| Environmental | Environmental harm or non-compliance during construction. | Require evidence of best practice environmental management in procurement, and weight contract award decisions accordingly. Audit compliance with environmental policy.<br><br>Adapt systems and controls based on findings and learnings on the job. |
| Counterparty | One or more elements of contractor consortium fail during construction. | Secure adequate securities and remedies that can be drawn upon allow job completion at no cost to the government.<br><br>Ensure a clean risk handshake between operator and contractor exists so no unplanned residual risk spills over to the government.<br><br>Appropriately weight financial substance and stability in contract award decision. |
| Stakeholder management & reputation | Poor stakeholder management during construction sours relationships in the immediate location of the construction effort, impacting on | Properly resource stakeholder management and run best-practice engagement and communications process.<br><br>Run regular construction update meetings with adjacent operators and landowners to ensure local issues are identified and managed on the ground and early. |

| | | |
|---|---|---|
| | rights of access and access flexibility. | |
| **Operating Phase Key Risks** | **Description** | **Mitigation** |
| Counterparty | A ferry operator fails. | Government backstop of KiwiRail port fee obligation.<br><br>Otherwise ensure a clean risk handshake between operator and contractor exists so no unplanned residual risk spills over to the government. |
| Facility performance | Facility fails to deliver to agreed service levels. | Port-Co's risk.<br><br>Ensure adequate commercial incentivisation of Port-Co exists around performance to agreed service levels.<br><br>Ensure a clean risk handshake between operator and contractor exists so no unplanned residual risk spills over to the government.<br><br>Ensure a workable and flexible new service/investment agreement template exists so Port-Co operators and users have a practical way of implementing operating and capital improvements over the facility lifecycle. |
| Picton bypass | A third ferry operator commences business at Picton and removes volume from Clifford Bay. | Develop shadow business case for single vessel cut-price operation into Picton and assess its commercial viability to provide greater understanding of this risk<br><br>Ensure KiwiRail and Strait Shipping are committed to Clifford Bay before issuing an EOI.<br><br>Ensu e Clifford Bay pricing does not push users past their indifference point.<br><br>Do not increase charges to westbound freight in the transition to Clifford Bay, as they receive no benefit. Do not increase charges to passengers in the transition to Clifford Bay as around half stay in Marlborough or travel to Nelson region.<br><br>Provide a Crown backstop around overall freight volume risk. |
| Freight & passenger demand | Freight and passenger volume less than expected, reducing Port-Co revenue. This could be a function of broader economic factors or modal shifts to coastal shipping (freight) of air travel (passengers). | If government provide a risk backstop around overall freight volume risk as recommended, outside prescribed boundaries this would be a government risk. This approach would reduce risk pricing and means the contractor is not heavily exposed to volume or bypass risk.<br><br>Risk appetite of the private sector should be explicitly tested at procurement phase to determine whether this is an efficient trade-off.<br><br>Base-case freight volume modeling in commercial negotiation should be conservative to reduce the cost of this risk to the government |

8. A number of generic land access and consenting risks exist in the development phase, and these have generic and typical mitigation strategies. Those risks specific to Clifford Bay, the most important to fully define and appropriately mitigate as early as possible in the development phase relate to Picton transition, operator commitment, and procurement (in the context of

the government role and the maximum government appetite for direct investment and ownership of freight volume risk).

9. Assuming a decision is taken to enter the development phase, the project should not move into procurement until ferry operator commitment is firm and Picton transition risk defined and mitigated.

10. The project should not be committed past the development phase if the procurement process fails to deliver a result inside the government's appetite for direct investment and risk.

11. This means the primary value at risk in the medium term for the government is the development phase budget.

# Stakeholder management and communications

## Introduction and summary

- Engagement has been limited to key parties in Marlborough including the Marlborough District Council, Port Marlborough and Chamber of Commerce.
- Feedback on the report's conclusions is recommended prior to the government making its decision, at least to the ferry operators to ensure ongoing goodwill.
- A programme for informing key parties has been prepared for when the government is ready to release information on its decision.

1. All parties involved in the Clifford Bay proposal are called stakeholders in this report and include the ferry operators and their customers, Marlborough organisations and communities, the government sec or involved in this commercial assessment, the media and public.

2. In addition to core engagement with the four primary commercial parties comprising the two ferry operators and their road and rail freight customers, only key parties in Marlborough have been kept informed of progress during the commercial viability phase. These Marlborough representative organisations include the Mayor and Chief Executive Officer of Marlborough District Council, Marlborough Chamber of Commerce, Destination Marlborough and Port Marlborough. The nature of engagement has been high level, with introductions to key project team staff and outlining what the commercial work phase involved. Meetings have also been held with key neighbouring landowners Peter Yealands and Dominion Salt at Lake Grassmere.

3. There have been repeated calls for economic impact and social impact work to be carried out prior to the conclusion of the commercial assessment, the stakeholder engagement has been useful in identifying key issues and effective in reducing the level of media attention on the project to date.

4. The report of the commercial assessment is eagerly awaited by the Marlborough community and a report back is recommended to the key stakeholders including ferry operators and, when appropriate, to the media and public. This should not prejudice any future decision making by the government, but is focused on updating key stakeholders at the conclusion of this phase of work. It would need to be a high-level summary of the overall conclusions and should emphasise that government decisions could take some months.

5. Not communicating high-level conclusions would lead to further concerns that Marlborough representative groups and their communities are being ignored and have no role in what is being decided about the ferry terminal location in their province. This is likely to result in ongoing media coverage in the local papers as local politicians and business leaders try to manage community and member expectations. If this communication is not considered acceptable prior to a government decision, then a separate strategy should be considered for communicating the high-level conclusions regarding the private benefits work to the two ferry operators, given the need for ongoing goodwill and collaboration. The risk of information leaks should be minimised by both ferry operators' concerns about keeping their business information confidential.

6. Within the Marlborough District Council territory eight iwi have Tangata Whenua status. Seven of these belong to the grouping of eight top of the South Island iwi, Te Tau Ihu (the prow of Maui's canoe). Te Tau Ihu will have its combined settlement legislation referred back to Parliament for the Second Reading shortly with the intention of the legislation being enacted by December 2013. The project team has met with Office of Treaty Settlements staff familiar with the issues and will keep them informed of progress.

7. For Clifford Bay, the two iwi regarded as having jurisdiction in this area are Ngai Tahu (through its Kaikoura arm Te Runanga o Kaikoura) and Rangitane o Wairau, based in Blenheim. Ngai Tahu's northern boundary on the east coast of the South Island is the White Bluffs (Vernon Bluffs) north of Clifford Bay. This is a disputed boundary with Rangitane o Wairau.

8. Local authority elections are scheduled for October 2013 and it is likely that candidates will be asked about their views on Clifford Bay.

9. Key stakeholder organisations in Marlborough associated with the unitary authority Marlborough District Council, particularly Port Marlborough, are generally negative to Clifford Bay. This view is entwined with the council's position as a major landowner in Picton and Blenheim as well as the sole owner of Port Marlborough. The Chamber of Commerce and Destination Marlborough both have wider perspectives and are more positive about the opportunities that could arise from Clifford Bay if there is assistance provided to support Picton through a new future and local organisations to redevelop their strategies.

## Communications

10. The purpose of the communications is to convey the conclusions of the Clifford Bay commercial assessment. Decisions made by the government would be part of a future work stream and this is addressed in the section entitled Next Steps.

11. The audience for these communications is diverse, including key Marlborough stakeholders Marlborough District Council, Port Marlborough, Picton

businesses and community, other Marlborough communities, ferry operators, commercial freight operators, the government sector, media and public.

## Key messages

- The Clifford Bay project team has completed its evaluation of the commercial viability on the option of shifting the South Island ferry terminal from Picton to Clifford Bay.
- The report has been provided to the Minister of Transport, the Hon Gerry Brownlee.
- A key area of the report was to establish what the private benefits are to the two ferry operators of a move to Clifford Bay.
- The government is presently considering the report.
- We are aware that people in Marlborough want a decision on Clifford Bay.

**Table 38: Delivery of decision**

| Channels | Content | Responsibility | Audience | Timing |
|---|---|---|---|---|
| Briefings | Presentation supported by video, media release | Minister supported by Ministry/project team | Interislander, Strait Shipping, Marlborough District Council, Port Marlborough, commercial freight operators | Just prior to media briefing |
| Media briefing | Presentation supported by video, media release, posters | Minister supported by Ministry/project team | Marlborough Express, Blenheim Sun, Radio NZ, Shipping Gazette, TV One, TV3 | Once briefings are completed |
| Website | Media release, Backgrounder, FAQs, Presentation, video, posters | Ministry of Transport | Public, other media, available to Marlborough District Council and other organisations for public information | Once stakeholder and media briefings are completed |
| Ministerial speeches | Key talking points developed for relevant ministers and Marlborough MP | Prepared by project team for Minister of Transport, Prime Minister/Minister of Tourism, Minister of Finance, Minister for Economic Development, Minister for State Owned Enterprises, Minister for Building and Construction, Minister for Small Business | Marlborough meetings/audiences, infrastructure or finance gatherings | From date of public announcements |

## Key documents

12. There are several key documents prepared about Clifford Bay over the past three years that stakeholders in Marlborough have expressed interest in accessing.

13. They are: the Covec report, the Business Case 2012, the Engineering report 2012, Cabinet Papers from 2011 and 2012, and this report. In late January 2013, the Minister of Transport confirmed that there would be no release of reports until a decision had been made following the conclusions of the Clifford Bay Investigation report back.

14. Decisions are required on whether any of these documents referred to above could be released or whether a summary or version without commercially confidential information of some of them could be made available.

# Regional economic impacts

15. The regional economic impact of relocating the inter-island ferry terminal from Picton to Clifford Bay has been a key concern expressed by the Marlborough community, its elected representatives and the majority of Picton-based businesses.

## Covec report

16. During the 2012 Clifford Bay Business Case phase a report was prepared by Auckland-based consultancy Covec. This independent assessment was of the potential economic impacts of the new terminal on the Marlborough region and of the distribution of those impacts within the region. It analysed port construction impacts, impacts on changes in spending by the ports, ferry operators, KiwiRail and Sounds Air and the impacts of changes on visitation. It does not explore a reinvigorated Picton as a gateway to the Sounds.

17. There have been many requests for the release of the Covec report from Marlborough organisations including the Marlborough District Mayor Alistair Sowman. In late January 2013, the Minister of Transport clarified that there would be no release of reports until a decision had been made to terminate or proceed.

18. The Covec report looks at the worst case conclusions from a shift of the ferry terminal to Clifford Bay and could be considered unhelpful. Its major findings are that the Marlborough economy would contract by $12.7 million, 211 jobs would be lost in Northern Marlborough with 69 gained in Southern Marlborough with the total loss of 142 jobs. Whilst there would be significant shifts in spending resulting from the transfer with Northern Marlborough incurring a loss in regional GDP, employment and household income, Southern Marlborough would gain in each of these categories but not by an equivalent amount.

19. The non-release of the Covec report has been reluctantly accepted by the Marlborough community but there is a continuing concern that regional economic impacts and social impacts will not be part of the commercial evaluation process. The key message communicated to Marlborough stakeholders during engagement this year is that the assessment of these impacts is for a subsequent stage, if the project is to proceed.

20. Social and regional economic impact reports would be expected to be part of any resource consent application if Clifford Bay is to proceed. They would each be researched and prepared by independent experts who would be available to be questioned in an Environment Court / Environmental Protection Authority process. To complete this work in advance of a strategy to cover the entire resource consent application would be imprudent.

# Future opportunities for Marlborough communities

21. How Marlborough would respond as a region, and separate smaller centres such as Picton, Seddon and Ward, to a shift of the ferry terminal is a further workstream. As it is Marlborough's vision for the future it would need to be led by Marlborough representatives with some professional assistance. Stakeholder meetings during late March consistently brought up the subject of the region needing "help" or "compensation" to manage local impacts if the shift occurred. The timeframe stakeholders referred to was in the years before the relocation so the region could adjust, rebrand and refocus its activities.

# Next steps

22. A government decision on whether Clifford Bay will proceed may take some time to finalise. Two options for decisions and actions for each of them are set out below, but it is acknowledged that there may be further options.

## Decision A – Clifford Bay proceeds to approval/further design

23. Actions:

- Stakeholder plan to identify key parties and issues and recommend messages and method of interaction.
- Development of key messages.
- Plan for delivering key messages through recommended channels to all identified audiences including the industry and media as in the Delivery of decision table above, including development of collateral to support the decision.
- Specific work on opportunities for Marlborough communities, which would include planning for the Southern Marlborough towns of Ward and Seddon as well as how Picton works towards a new future.
- Identification of shop front and Clifford Bay information centre in Marlborough.

## Decision B – Clifford Bay does not proceed at this time

24. Actions:

- Development of key messages.
- Plan for communicating decision to key stakeholders through recommended channels to all identified audiences as in the delivery of decision table above including development of collateral to support the decision.

# SECTION 5 | APPENDICES

# Appendix 1: Construction and operation – key risks and issues

## Introduction and summary

- A high level review of key risks and issues relating to the construction and operation of Clifford Bay has been undertaken. The objective of this review has been to check for fatal flaws in the ability to build or operate the terminal. Existing intellectual property, along with more recent information has been reviewed.
- The main risk examined is availability of construction material for the breakwater. All four quarries examined as part of this review are expected to be able to provide rock of required durability and quantity but larger rock appears more difficult to source. An alternative solution for breakwater material has been identified. If the project proceeds, more detailed design would be required.
- Further investigation and analysis of ship manoeuvrability and stability would be required if the project proceeds to the next stage. Based on the high level review, this analysis is unlikely to result in changes that make the location unfeasible.
- The seismic hazard assessment of the proposed Clifford Bay site is not expected to change as a result of recent seismic activity in Marlborough. If the project proceeds to the next stage, an update of the previous seismic study is likely to be required.
- Operational risks such as storm events and tsunami have also been reviewed. No fatal flaws have been identified that would make the location unfeasible. However, additional data collection and analysis are recommended if the project proceeds to the next stage.



1. This chapter outlines the results of 2013 review studies that have been commissioned from Beca[42] and URS Ltd[43] to examine the continued relevance and ability to rely on previous work done on construction and operation. In particular, emphasis has been placed on identifying and improving understanding of key risks, and work that would need to be refreshed or extended in any subsequent stages.

2. The chapter is broken into three main components.

42 Beca is an engineering and related consultancy service group in the Asia Pacific region, and has provided engineering support to Clifford Bay over the last 20 years, including concept designs in 2000 and 2012.

43 URS is an integrated engineering, environmental, construction and technical services organisation operating across the Asia Pacific region, and was involved in Port infrastructure assessment work on Clifford Bay in 2012.

- Risks in construction, which mainly discusses risks around rock supply.
- Risks in ship manoeurvring, which discusses previous studies on how ships travel into the port and berth, including their stability at berth.
- Performance risk of the facility in operation, which discusses exposure to seismic events, tsunami and storm, and the practicality of the assumed operational dredging.

## Risks in construction

3. Beca was commissioned by the Ministry to review (and where appropriate update) previous work relevant to the construction and operational performance of Clifford Bay. Development of a ferry terminal at Clifford Bay has been the focus of various engineering and environmental studies.

4. In 2012, Beca, in conjunction with NZTA, Bond CM and Traffic Design Group provided an updated concept design and out-turn cost of Clifford Bay for the Ministry of Transport. The purpose of the update was to develop the functional requirements by extending the basis of design for a single user format prepared in 2000 to a multi-user facility. The update catered for the current ferry sizes for both rail and RoRo, quarry source, rail freight requirements, and passenger and commercial vehicle usage patterns.

5. The base scenario was a single pier, two berth layout to provide a multiple user port with supporting infrastructure designed to allow flexible operation between users. The table below summarises the capital cost for the base case as it was estimated in 2012 in the Beca work. Indexed to $2014 so as to be consistent with the other analysis, the total P50 cost is estimated at $434 million.

**Table 39: 2012 Clifford Bay concept-level costing**

| Description | Capital cost ($2012) |
|---|---|
| Project base estimate | $338m |
| Project expected estimate, P50 | $422m |
| 90th Percentile project estimate, P90 | $507m |
| **Line item summary** | **($2012)** |
| Preliminary & general | $46m |
| Breakwater | $75m |
| Reclamation | $51m |
| Dredging | $9m |
| Berths | $18m |
| Linkspans and ramps | $28m |
| Foot passenger terminal | $6m |
| Onshore facilities | $22m |
| Services | $5m |
| Rail facility & marshalling yards | $21m |
| SH1 to port facilities (by NZTA) | $15m |
| Principal managed costs | $41m |
| **Total project cost** | **$338m** |
| **Assessment of risk & uncertainty (25%)** | **$84m** |
| **Total estimated out-turn cost** | **$422m** |
| **Total estimated out-turn cost restated in $2014** | **$434m** |



6. The 2012 report highlighted a number of risks related to construction that would need to be addressed in the future. The 2013 investigation approach has been to explore these risks, predominantly to test for fatal flaws in construction feasibility rather than refine design or cost estimation. The key areas of risk are examined below.

## Sourcing of rock to armour the reclamation

7. The reclamation associated with Clifford Bay would require a large quantity of accessible rock material of the appropriate size/grading, durability and density, to provide protection from the sea environment. The high level design carried out in 2000 was based on using the Stirling Brook area as a suitable rock source. Project costs at that time were based on extracting and transporting material from there.

8. Since 2000 the owners of the Stirling Brook property have secured a QEII covenant[44] for the site. This means an alternative source will need to be found for the Clifford Bay project. A considerable risk margin was therefore allocated to the rock sourcing item during the work carried out in 2012.

9. The current investigation has carried out a qualitative suitability assessment of 25 quarry sites in the area. The top four scoring quarries were then considered in more detail.

10. To assess the risks associated with rock supply and the cost risk of obtaining rock from each of these sources, concept level quarry development plans have been prepared or obtained (where these already exist). Key risks in obtaining rock for the project follow.

    - The rock source – is there a sufficient volume of rock of sufficient quality and size grading?
    - Transportation – how far must the rock be transported and does this require new road construction, easements or land purchase? Are there restrictions on truck movements? Is rail viable?
    - Consenting – does the quarry have current consents and are they likely to be extended? For rock sources not already developed, are environmental factors likely to be surmountable?

11. The table below shows the relative probabilities (at a high level based on information currently available) of the top four sources able to produce the larger size material.



44A QEII National Trust Covenant can be placed on a parcel of privately owned land that will legally protect it in its current natural landscape form in perpetuity. The site can then not be developed for other purposes.

**Table 40: Rock source availability by quarry**

| | | Rock weight | 3000 to 5000kg | 600 to 1700kg |
|---|---|---|---|---|
| **Quarry** | **Distance from Clifford Bay** | **Status** | **Probability of supplying suitable rock** | **Probability of supplying suitable rock** |
| Pukaka | 58km | Consented | 15% | 65% |
| Barrack Rd | 63km | Consented | 65% | 75% |
| Flaxbourne | 5km | Consented | 10% | 50% |
| Blind River | 28km | No consent | 100% | 100% |

12. To put rock supply risk into context, the table below shows the various types and quantities of quarry rock required for the reclamation and breakwater.

**Table 41: Rock source availability summary**

| **Armour & underlayers** | | | | | |
|---|---|---|---|---|---|
| **Type** | **Weight range** | **Breakwater** | **Reclamation** | **Total** | **Comment** |
| Heavy armour | 3 to 5 tonne | 105,000 m3 | 0 m3 | 105,000 m3 | Material sourcing is a significant risk issue |
| Armour & underlayers | 800 to 1700kg | 10,500 m3 | 0 m3 | 10,500 m3 | Material sourcing less of a risk issue |
| | 600 to 1400kg | 60,300 m3 | 13,700 m3 | 74,000 m3 | |
| | 500 to 1000kg | 0 m3 | 32,400 m3 | 32,400 m3 | Material sourcing not a risk |
| | 300 to 700kg | 0 m3 | 9,500 m3 | 9,500 m3 | |
| | 160 to 340 kg | 0 m3 | 3,200 m3 | 3,200 m3 | |
| | 10 to 40kg | 0 m3 | 26,000 m3 | 26,000 m3 | |
| General fill | All in rock & rubble | 465,000 m3 | 596,000 m3 | 1,061,000 m3 | |

13. There is a high degree of probability that all of the 600 to 1700kg rock required for the project would be able to be sourced from the three consented quarries. However, there is still significant doubt as to whether or not the heavy armour can be produced in sufficient quantity from the consented quarries. The most problematic size rock is the 3–5 tonne weight range. The risk of supply of this rock weight led to a further investigation into the feasibility of manufactured alternatives as part of this 2013 investigation.

14. Accropodes (manufactured concrete armour units) were found to be suitable alternative armour units for the seaward side of the breakwater. The cost and effort to form and place these can be derived with a relatively high level of confidence. The base cost of this option is likely to be higher given the cost of concrete compared with quarried rock. The reclamation armouring design would also need to be modified to incorporate their use.

15. Revised physical works cost estimates (including risk) have been developed based on the work carried out during this study, and this has found that the higher costs of this approach are offset by increased confidence in expected cost. This means that feasible mitigation to rock supply risk exists with a relatively high level of confidence, without requiring an increase to base cost assumptions. The project is therefore expected to be reasonably commercially resilient to an uncertain supply of heavy armour rock.

## Risks in ship manoeuvring

16. This chapter describes assessments of the ship entering the port (called ship motions from deep water to berth), manoeuvring near the berth area (analogous to parking a car – called ship manoeuvring), and then stability at berth.

17. URS Ltd were commissioned to undertake a high level "peer review" of existing information[45] relating to the vessel operations at the proposed Clifford Bay port and ferry terminal development. The focus of the review was the adequacy of existing information including its robustness, methods, assumptions and conclusions.

18. A strategic decision has been taken by Interislander to adopt a road bridging model. This means their future vessels will not be rail enabled. In addition, operators are likely to consider vessels that are generally larger than those currently in use as fleet replacement decisions are made. This may have a

45 The following is the list of primary information selected and reviewed as part of the URS scope of work.
Lawson and Treloar Pty "Clifford Bay, NZ Port and Terminal Development" Report J2229/R2076 December 2003. – Prepared for OMC
OMC: Clifford Bay stage 2: "Ship Motions from Deep Water to Berth." (Jan 2004)
Seatech Consultants "Clifford Bay Ship Manoeuvring Study 2003" – Prepared for Tranzrail NZ
OMC: " Clifford Bay Stage 4 "Ship Motions at Berth " (Report 2) – dated 13 July 2011
OMC: "Clifford Bay Mooring Analysis Part B: MoorMaster Units" – prepared for Beca 21 December 2010
Beca Report "Clifford Bay Port and Terminal Development Report No. 20 – Project Description for Clifford Bay 2000". Dated September 2000. Prepared for Trans Rail NZ Ltd.
Beca Drawings "Clifford Bay Port Development (Scenarios 1 – 4)" Dated Jan – March 2012

significant effect on vessel operations in the approaches to and within the port, the extent of the proposed port infrastructure and the associated project development costs.

19. The conclusions reached in previous studies were vessel specific, and the Aratere (before it was lengthened) was the design vessel for most of these. In addition, some of the environmental information used in the previous investigations and analysis is becoming dated. Vessel assumptions and environmental information need to be updated to reflect current assessment techniques as well as infrastructure technology developments. Overall, although much of this previous work is still relevant, the conclusions provided are not as robust and comprehensive as would be expected had assumptions about design vessel, recorded climatic and marine information, and user requirements been updated to the current understanding.

20. In addition, many of the previous reports were commissioned with a focus on particular and often singular objectives. Further work should adopt an integrated project approach to provide a more comprehensive evaluation and assessment of the coincident climatic and sea conditions that can be expected at the facility.

21. URS Ltd considered that further investigation, analysis and reporting would need to be undertaken to support the proposed port and terminal development. This work is unlikely to result in changes to the project to such an extent that it will significantly affect the vessel operations, port development and project feasibility. However, further investigation would need to be undertaken to support further planning and resource consenting phases.

22. This work is likely to result in more robust engineering design solutions to the vessel port related infrastructure such as, the breakwater location and extent, size of the vessel turning basin, ferry terminal pier, fendering and mooring systems as well as access for road vehicles to the ferries. This work may also include advice on times when adverse weather may affect vessel operations at the port.

## Vessel fleet configuration

23. A summary of the most relevant vessel parameters are provided in the following table, which also includes an indication of the kind of vessel which may seek to use Clifford Bay in the future.

**Table 42: Vessel parameters**

| Vessel | Year built | Length (m) | Beam (m) | Draft (m) | Propulsion & vessel manoeuvring | Service speed (knots) | Freight capacity | Passenger capacity |
|---|---|---|---|---|---|---|---|---|
| **Strait Shipping** | | | | | | | | |
| *Straitsman* | 2005 | 124.9 | 23.4 | 5.3m | 2 main props, 2 bow thrusters and stabilisers | 18.8 | 1,248 lane metre | 400 |
| *Santa Regina* | 1985 | 137.0 | 22.5 | 6.0m | 2 main props, 2 bow thrusters and high flap rudders | 18.0 | 1,300 lane metre | 370 |
| **Interislander** | | | | | | | | |
| *Aratere (Extended in 2011 from 150m)* | *1998* | *183.5* | *20.3* | *5.9m* | *2 main propellers (FP), 2 bow thrusters, 2X high lift rudders and folding fin stabilisers* | *19.5* | *28 rail wagons, 30 trucks or 230 cars* | *670* |
| *Arahura* | *1983* | *148* | *20.5* | *5.6m* | *2 main props (CP), 2 bow thrusters, stabilisers (CP)* | *20.0* | *60 rail wagons, 125 road vehicles, 12 trucks* | *550* |
| *Kaitaki* | *1995* | *181.6* | *23.4* | | *2 main props, 2 bow thrusters, 2 high flap rudders* | *20.5* | *1,780 lane metre or 600 cars on 3 decks* | *1650* |
| **Indicative future vessel** | | | | | | | | |
| *Norman Voyager* | *2008* | *186* | *25.6* | *6.6m* | *assumes 2 main props, 2 bow thrusters, 2 high flap rudders* | *24.2* | *2,285 lane metre* | *850* |



24. Note the indicative future vessel length is similar to the maximum in the existing fleet but the additional draft at 0.7m, the increased beam at 25.6m and possibly additional wind effects on the larger exposed vessel superstructure will be additional factors to consider for vessel operations within the proposed port.

## Ship motions from deep water to berth

25. The Aratere (before it was lengthened from 150m to 183.5m) was the design vessel selected for the Ship Motion Analysis report undertaken by Oceanic

Marine Contractors in 2004. The primary recommendations of that work relate to channel depth associated with the nominated design vessel performance under particular combinations of adverse weather conditions. The vessel ship motions were considered at 14 separate locations for various predicted wind and sea states as the vessel approaches the port, manoeuvres within the port, berths and departs the port.

26. This report concludes that for the 5 hours in 1 year weather condition events, very little dredging is required to provide the channel under keel clearance for the nominated design vessel. However for the 1 hour in 5 year weather condition events, significant dredging of up to 1.7m depth is required to satisfy the vessel under keel requirements.

27. The design vessel adopted for this study was only 150m long, and the indicative future vessel has a maximum draft of 6.6m - approximately 0.7m greater than the draft considered in this report. These changes need to be considered as part of future ship motion analysis work as this is likely to provide the design basis for some of the port infrastructure. Consequently the conclusions of the earlier work on ship motions from deep water to berth are of limited value and as a minimum need to be updated using a range of nominated existing and future ferry design vessels representative of those expected to use the port. This relates to under keel clearance requirements in particular.

28. The findings of any further more comprehensive and up-to-date wave studies and climate information should also be incorporated into further ship motion analysis work.

## Ship manoeuvring

29. Previous work on ship manoeuvring was reviewed. This work had the following as its prime objectives.

    a) To determine the manoeuvring area required for the design ship to reduce speed, turn and berth in high winds.

    b) Determine the manoeuvring area required for the design ship to leave the berth, gain safe steerage and clear the breakwater in high winds.

    c) Estimate the limiting wind speeds for safe berthing and departure.

30. The nominated design ship for this study was again the Aratere with an overall length of 150m, compared with the present length of this vessel of 183m. This limits the value of the conclusions of the previous work.

31. The wind speeds modelled ranged from 35–39 knots mean wind speed. Tidal currents were not modelled. 33 vessel runs were undertaken, 13 of which were outward bound and 20 inward. The vessel was turned for all inward runs within a proposed vessel manoeuvring basin located just to the north of the berth.

32. The report concludes that the proposed harbour layout would be feasible as regards ship manoeuvring subject to the provision of a dredged manoeuvring basin, assuming the results of the ship motion studies were also satisfactory. The extent of the dredged basin just north of the main ferry vessel berthing area was not expected to require significant dredging works to be undertaken.

33. The report presented maximum limiting wind speeds (knots) for berthing and departure, and stated that tidal and wind driven currents were not simulated as they were thought to only have a slight effect on ship handling, however it did advise additional work when the port layout had been confirmed with these currents added.

34. The URS Ltd review noted with concern that as part of the ship manoeuvring study the wave and swell conditions which are often associated with adverse wind events do not appear to be taken into account in combination with the high winds affecting the exposed surfaces of the vessel above the water line. URS Ltd recommended that further investigation into wind and swell generated wave climate in conjunction with high winds be undertaken if the project progresses.

35. URS Ltd advised that the future ferry vessel fleet could require a larger vessel turning basin located just to the north of the proposed ferry berthing area than that which was previously proposed for the 150m long Aratere. They recommended that a deeper draft similar to the indicative future vessel be utilised to determine the increase in under vessel clearance requirement. This may require the presently proposed vessel berthing area to be located further to the north in deeper water, the breakwater extended to the north and possibly also moved to the west, or additional dredging works to be undertaken, or a combination of these.

## Vessel motion at berth

36. Previous work on vessel motion at berth was reviewed. This report considered the 150m long Aratere and the Kaitaki in its design parametres.

37. Appropriate combinations of wind generated waves, swell waves and long period waves (70s–100s) were considered to affect the vessel at the berth. Various return periods were considered for adverse weather events including: 12hrs/yr, 5 hrs/yr,1hr/yr, 1hr/5yrs.

38. The report concludes that:

    a) Traditional fender and mooring line arrangements will not safely moor either design vessel.

    b) Appropriate combinations of MoorMaster mooring units are able to successfully moor the vessel at the berth providing the linkspan is capable of preventing vessel surge. In addition the interaction of the MoorMaster mooring units with the linkspan relating to sway at the stern of the vessel needs to be further investigated.

c) Downtime of 1 hour per 5 years can be expected with the vehicle link span.

39. The vessel motion at the berth needs to be reviewed with consideration to the full range of ferry vessels that are anticipated to use the port, and the interaction between the mooring systems and the stern link span arrangement also needs to be carefully considered.

# Risks in operation

- The following operational risks were highlighted in the 2012 Beca report and have been investigated as part of this current phase.
- Seismic risk.
- Tsunami risk.
- Risk of a significant storm event (both in operation and during construction).
- Sediment build up and dredging requirements.
- Wave action in the port in operation.

40. Historical studies and reports relating to the above risks were prepared to support the previous resource consent process and design in 2000. This material was reviewed with key recommendations summarised. In addition, new information developed since that time was collated and interpreted.

41. In summary, no fatal flaws have been identified in the course of the current study which would materially impact on the Clifford Bay site being considered as an appropriate location for the new facility either during construction or operation.

## Seismic risk

### Previous studies

42. The proposed Clifford Bay facility is located in an area of high seismic hazard and on a site with generally competent rock subsoil material covered by approximately 2m of sandy muds. Several earthquakes with magnitudes between 5.3 and 7.3 have occurred within 200km of the site in the last 150 years. Also, more than a dozen known active faults, closer than 100km from site are considered possible sources of strong shaking at the site.

43. A report prepared in 1996 by Beca Carter Hollings and Ferner documented the results of a seismic hazard analysis carried out for the proposed site in conjunction with the Institute of Geological & Nuclear Sciences Ltd (GNS).

### New information

#### *Earth quakes*

44. In 2010 an updated seismic model was released by GNS that supersedes previous models. This should be used as the basis of seismic design of the new port facility. It is anticipated that a site specific seismic study should also be carried out as a parallel check of design requirements.

45. It is considered that previous recommendations in regard to the maximum level of shaking due to a local event associated with the London Hill fault are still appropriate. No new faults in the vicinity of the proposed port have been discovered.

46. Localised uplift of the Lake Grassmere area is expected due to on-going activity on local faults and at the Hikurangi subduction zone due to collision of the tectonic plates. The likelihood and quantum of such movement is not expected to be large (if at all) over the expected life of the facility. However, the likelihood of this risk needs to be better understood to inform design.

***Liquefaction***

47. Since 2000, the Christchurch earthquakes have provided a clear reminder of the impact of liquefaction on infrastructure. As outlined in the chapter discussing previous studies, the Clifford Bay area is underlain by sediments which could liquefy in a seismic event.

48. Foundation conditions for infrastructure will therefore need to be designed to appropriately mitigate this risk. Geotechnical testing to inform the detailed design phase should be scoped to assess the liquefaction risk associated with the currently proposed port layout (both offshore and on shore components).

***The 2013 Cook Strait earthquakes***

49. In the course of completing this current study, the Cook Strait region has been subject to significant seismic activity during July and August 2013 with two magnitude 6.5-6.6 earthquakes at an epicentre around 15-20km from the proposed port site. Those quakes were accompanied by numerous aftershocks and have been of national interest.

50. This has subsequently raised questions about the seismic hazard to the proposed site and appropriateness of previous design assumptions.

51. In the course of preparing this report various discussions have been held with GNS (both pre and post-earthquake) to gain the most-up-to-date understanding of the seismic hazard and future work to be carried out to inform the design stage.

52. The key points from these discussions are as follows.

- The recent M 6.5 event generated ground motions approaching 10% of 1 in 50 in year ground motions, which is significantly less than has previously been recommended for design purposes, that is M 7.3 event on the London Hill fault with an epicentre 1km from the site.
- The seismic hazard to the port is not likely to change due to recent events. The regions seismic hazard model has been built based on numerous events over a sustained period (the July activity is well within the boundaries of the hazard model).
- The recent events are not considered unusual. It is anticipated that similar sized events are expected to occur in the region once every ten years or so.
- Fault activity within the Cook Strait area is complex and it appears that the recent activity may be on a previously unknown fault or an

offshore extension of an existing, but poorly understood fault. It may even be due to events on more than one fault. Work is progressing to inform the underlying faults associated with the recent events.

- Additional seismometres are being installed throughout the region to assist in the above process.

### Recommendations

53. While the seismic hazards to the proposed Clifford Bay site is not expected to change as a result of the recent events, it is recommended that ongoing dialogue be maintained with GNS and an update of the previous seismic study be completed if deemed necessary to inform the design phase.

## Tsunami hazard

### Previous studies

54. A study on tsunami hazard to the port was carried out by Beca Carter Hollings and Ferner in 1996. The study was based on a benchmark study prepared by Barnett et al (1991) for the Museum of New Zealand site in Wellington Harbour. That numerical analysis was based on design waves caused by faulting in a local earthquake and on an estimate by Gilmour (1989) of a 100 year design tsunami for Cook Strait. The 1996 study considered water fluctuations from both remotely and locally generated tsunami.

### Interpretation

- Previous studies concluded the following in regard to tsunami. A water level rise of 3.1m due to long-period remotely-generated tsunami should be designed for. The proposed terminal building floor level has been assumed to be 3.75m above chart datum which is clear of the water level noted above.
- Important services should be waterproofed or located on the breakwater wall at an elevation above 3.5m.
- Fire fighting equipment should be keep clear from the tsunami zone of influence.

### New information

55. GNS have been collecting and analysing evidence of historic and pre-historic tsunami at Big Lagoon at the mouth of the Wairau valley (approximately 20km from the proposed Clifford Bay port site) over the past 10 or so years.

56. Later this year a coastal tsunami hazard model will be available which will provide information on the likely size and return period of tsunami around the New Zealand coast line, including the Clifford Bay area, which will supersede previous estimates.

### Conclusions and recommendations

57. The key conclusions and recommendations out of the 1996 study and information available since that time are as follows.

- An evacuation plan should be developed for the contingency of inundation by remotely generated tsunami.

- Numeric models of possible tsunami events should be developed based on the research undertaken to assess the impact at the port site and inundation extent to both inform the design and emergency procedures.
- Based on previous studies it would appear that while tsunami hazard and risk needs to be considered and addressed in design it is unlikely to represent an overly restrictive constraint on the viability of the proposed facility.

## Sediment build up and dredging in operation

### Previous studies

58. The following studies have been carried out on the sediment transport associated with the proposed port and terminal development at Clifford Bay, and have been reviewed in this investigation phase.

    - NIWA (Green Black and Carter (1996))
    - Kirk and Single Report 1996
    - Coastal Consultant Ltd (1998)

### Conclusions and recommendations

59. The key conclusions of these studies have been checked against the assumed dredging and foreshore management requirements in the Clifford Bay concept design.

60. Previous estimates of likely dredging requirements appear to be at the right order. Studies for resource consents will need to be more rigorous than those carried out for the 1998 application. A hydrodynamic model of the wave and tidal current regime will likely be required as well as a coupled sediment transport model to better understand the sediment capture and potential adverse effects.

## Storm related risk during construction and in operation

### Previous studies

61. Beca carried out hydraulic studies in 1996 (this assessment made use of wave and current information recorded at the site and built on the work carried out on a number of other studies in 1995) and in 2000 when expected hydraulic conditions were integrated into the development of a construction methodology aimed at minimising cost and rework due to adverse marine conditions.

## Maximum expected storm conditions

62. The design wave conditions (based on significant wave heights for the site) are summarised below.

**Table 43: Design wave conditions**

| Deep water direction | Return period (Years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | | 1 | | 5 | | 50 | | 100 | | 200 | |
| | T (s) | Hs (m) | T (s) | Hs (m) | T (s) | Hs (m) | T (s) | Hs (m) | T (s) | Hs (m) | T (s) | Hs (m) |
| NW | 3.6 | 1.1 | 3.8 | 1.2 | 4.0 | 1.6 | 4.2 | 1.9 | 4.4 | 2.1 | 4.4 | 2.2 |
| N | 5.1 | 1.8 | 5.2 | 2..0 | 5.3 | 2.0 | 5.8 | 2.8 | 5.9 | 2.8 | 6.0 | 3.0 |
| NE | 5.5 | 1.6 | 6.4 | 2.2 | 7.5 | 3.2 | 8.2 | 4.2 | 8.3 | 4.5 | 8.5 | 4.8 |
| E | - | - | - | - | 8.3 | 2.7 | 9.7 | 3.8 | 9.8 | 4.4 | 9.8 | 4.8 |
| SE | 9 | 1.9 | 9 | 2.3 | 9.3 | 2.2 | 10.3 | 3.2 | 10.5 | 3.4 | 10.7 | 3.8 |
| S | - | - | - | - | 10.7 | 1.9 | 12.1 | 2.9 | 12.4 | 3.3 | 12.7 | 3.7 |

T = Wave period in seconds (i.e. the time between successive wave crests)
$H^s$ = Significant wave height in metres (i e. the wave which represents the average of the highest 33% of the waves)

### *In operation*

63. The current concept design uses 5.5m as the significant wave height. Using this design wave the main breakwater height was set at 6m above chart datum increasing to 9m above chart datum in the vicinity of the operational area to minimise splash and overtopping locally. At detailed design stage a physical model should be developed to assess the extent of overtopping and overflows to be accommodated by the physical drainage system.

### *During construction*

64. The information in above would be used by an experienced marine contractor (along with the background raw data collected at the time) to develop and implement a construction plan which would include staging and allowance for rework during construction as a result of a storm event with a return period of up to 5 years.

## Conclusions and recommendations

65. The primary conclusions are as follows.

- If Clifford Bay proceeds to the next phase, collection of wave data should recommence.

- Modelling should be undertaken during detailed design to provide better information on wave size.
- It is expected that an experienced marine contractor will be able to utilise collected wave data, studies and modelling in order to develop an appropriate strategy to mitigate and allow for rework in a storm event. Contract documentation should be used to provide incentives to contractors to proactively manage these risks.
- The breakwater has been located and orientated to provide protection from storm events that are possible over the life of the facility. The level of the breakwater has been set such that overtopping occurs in infrequent events and infrastructure will be designed to accommodate this.