"Our Ocean Exploration Centre"
Pre-Feasibility Study Summary Report

Prepared by

Wellington Marine Conservation Trust

June 2009

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The Story

In March 2008, we abandoned our High Court appeal of the Environment Court's decision to deny consent for our proposed marine education centre and aquarium at Te Raekaihau. But Judy Hutt and I and the other trustees knew that the majority of Wellington residents still wanted this Centre to go ahead and many encouraged us not to give up.

We felt strongly that the benefits of a new centre shouldn't be lost to Wellington and New Zealand residents, and that we should pursue our vision to create a new marine education centre and aquarium on the Wellington South Coast. Therefore, we decided to carry out a preliminary feasibility study of using the old Maranui Quarry and Depot in Lyall Bay as an alternative site for the new centre.

We received the necessary funding for the study last October from a number of prominent and ordinary Wellingtonians, whose support has helped the Trust pursue its vision to date, and a grant from the Wellington City Council's Economic Development Pool. The study was completed in April 2009 and this report presents a summary of the results of both the physical suitability of the Maranui Quarry site for our proposed new "*Our Ocean Exploration Centre"* and the financial feasibility of the project.

We believe we Wellingtonians should be investing in the future of our city and the next generation by supporting projects that will promote sustainable environmental conservation and maintain Wellington's competiveness within New Zealand and internationally as a destination of choice so our economy can continue to grow.

Those of us who live in Wellington sometimes forget how lucky we are to have not only a beautiful Harbour, but also to have a fantastic natural resource on our South Coast and in Cook Strait where marine life found nowhere else draws scientists from all over the world.

In view of increasing worldwide awareness of human impacts on our atmosphere and oceans, and the present global economic slowdown, we think that a new marine centre is needed now more than ever.

We envisage that the new centre at Maranui will be a world-class marine education facility, a major nature-based visitor attraction for Wellington regional residents and visitors from outside the region, and a catalyst for change how we perceive, use, and manage our national marine environment and Exclusive Economic Zone – the world's 4th largest.

The overall results of the pre-feasibility study, summarised below, were positive, very encouraging and definitely warrant carrying out a full-feasibility investigation of the Maranui site. The other trustees and I are very excited by the results of this study and are again ready to take up the challenge of bringing our vision to reality.

We can't wait to welcome the first busload of school children and visitors to join us on an exciting and educational exploration into the depths of Cook Strait and the hidden underwater world on Wellington's front doorstep.

Dr Victor Anderlini
Chairman

The Vision

The WMCT's vision is to help create a generation of eco-literate New Zealanders who will have an expanded awareness of the importance, beauty and fragility of New Zealand's vast but vulnerable marine ecosystems and who are committed to the protection and sustainable use of these mostly unseen environments.

The Trust considers that the first step towards responsible management of our ocean resources is public education about the sea and providing the means for everyone to see and learn about the unique marine life that shares our ocean world. The trustees believe that to achieve our long-term environmental conservation goals, we must expand our present operations to include a purpose-built, self-supporting *"Ocean Exploration Centre"* that will offer unique, exciting and educational learning opportunities to both residents and visitors alike, and provide regional and national leadership in marine conservation advocacy.

The new Centre will be the flagship of the Trust's marine conservation programmes, a showcase for the region's marine research, training and tourism products, and the economic engine for the Trust's marine education and advocacy objectives.

Through the Center's displays and activities, we aim to empower individuals, influence policy and contribute to the protection of the New Zealand's marine environment for future generations.

The Trust proposes to focus the Centre's activities on achieving three key goals that build on our current efforts and offer new ways to assure a future with healthy oceans. These key goals are:

1. ***To operate a world-class, financially sustainable public Marine Education facility;***
   We will expand our current marine education programmes and offer many more opportunities for visitors to engage in both formal and informal marine education experiences within the Centre.

2. ***To be the leading national centre for the protection of Marine Ecosystems and Wildlife;***
   We will advocate for local, regional, national and international policies that conserve and restore threatened marine wildlife and ecosystems within New Zealand's territorial waters and the wider South Pacific.

3. ***To achieve the inclusion of 5% of New Zealand's EEZ into Marine Protected Areas by 2020;***
   The Centre will lead and support efforts to develop and promote achievable goals for the creation of a new network of marine protected areas and marine reserves in New Zealand's coastal and vast EEZ offshore waters.

The Study

The scope of work and a proposal for the feasibility study was developed by the Pre-feasibility Steering Group comprised of Dr Victor Anderlini (WMCT), Richard Miller (McDermott Miller), and Grant Macaskill (Woods Macaskill).

The scope of work focussed first on developing a new project concept and an exhibit design layout that would reflect the Trust's vision and long-term marine conservation goals. Once these were defined and agreed by the Trust, the suitability of the site to physically realise the Trust's vision for a new Centre was investigated.

During this phase, planning, geotechnical, architectural, landscape, traffic and cultural investigations were carried out to determine the required size and a preferred location for the new centre. This information was then used to provide an estimate of capital costs for the project.

The results from both the above work streams were used to determine the marketing and financial feasibility of the Centre and to develop a proposal for a new funding, governance, and management model for the Centre project.

The three, inter-related work streams were carried out by the following consultants:

- Concept Development and Exhibition Planning - WMCT and Thorburn Consultants;
- Site Development Planning and Feasibility - Woods Macaskill Consulting with specialist contributions in:
  Architecture – Athfield Architects
  Landscape Assessment – Wraight & Associates
  Geotechnical & Geo-environmental Assessment – MWH New Zealand
  Traffic Engineering – Traffic Concepts
  RMA Consents Strategy – MWH New Zealand
  Maori Cultural Impact – Raukura Consultants; and
- Business Development Feasibility - McDermott Miller Strategies Ltd.

The results of these investigations are presented below.

The Concept

"Our Ocean" Concept and Goals

The Environment Court's decision gave the Trust the opportunity and time to re-evaluate the objectives and rationale of the original proposal and to consider the possibility of finding a new site to deliver an even better educational and recreational experience to Wellington region residents and national and overseas visitors.

Our decision to abandon our High Court appeal and consider a new location to realise our vision, also allowed us to re-evaluate the goals and objectives for our original project and develop a new concept for the project in the first stage of the pre-feasibility study.

Rather than attempt to transfer the original concept, building and exhibit design directly from Te Raekaihau to the potentially new site, we developed a much more exciting, broader and more focussed concept for the new facility and have concentrated on increasing the variety, scale and complexity of the exhibits and visitor programmes to take advantage of this site's larger and less constrained size.

The proposed new "Our Ocean" concept is aimed at attracting as many visitors as possible to our new Centre on the Wellington South Coast so they can take the first steps towards gaining a better understanding of our intimate relationship with New Zealand's marine environment and the world's oceans.

We propose to provide a wide variety of opportunities for visitors to interact with the Wellington region's coastal and marine environment and have an exciting, enjoyable, interesting and especially educational experience at our facilities and through our programmes.

The Trust's existing Island Bay Marine Education Centre facilities will be an integral part of this new concept since they are already well known and are located immediately adjacent to the seashore on Wellington's South Coast. They are also located at the centre of New Zealand's newest marine reserve, the "Taputeranga Marine Reserve."

This unique position offers the Trust the opportunity to offer a wider variety of educational and promotional activities to attract more visitors to our facilities and programmes.

The primary goals of the "Our Ocean" concept are to:

- Expand public awareness of how our ocean heritage has influenced, and continues to influence our history, culture, art, science and commerce;
- Increase public appreciation of the beauty and fragility of the marine world around Wellington's rocky south coast, the wider Cook Strait region, and New Zealand's vast Exclusive Economic Zone
- Promote greater understanding of how all life on Earth is dependent on the health of our oceans through our formal and informal marine education programmes, activities and live displays; and
- Inspire commitment to take action in our daily lives to preserve the health of the sea, and provide ways to do so.

"Our Ocean Exploration Centre" Objectives

The objectives of the "Our Ocean Exploration Centre" project are:

- To add a new, much needed, financially sustainable, all weather, nature-based visitor attraction to Wellington's existing "Zealandia," the Wellington Zoo and other regional, environmentally focussed attractions;
- To deliver significant educational, recreational, cultural, social and economic benefits for Wellington region residents as well as for visitors from outside the region;
- To provide a focal point for regional and national marine conservation policies, and assume leadership in marine conservation education and advocacy.
- To capitalise on the investment WCC has already made in improving the infrastructure of the South Coast, and build on the community's support of the Trust's previously proposed Marine Education Centre project and existing Island Bay facilities;
- To incorporate the Trust's existing premises and activities; and
- To take advantage of the logistical, educational, and recreational benefits of the site's South Coast location.

The Centre's primary "points of difference" from other facilities in New Zealand will be:

- Its location on the Wellington South Coast and the shores of Cook Strait;
- Its close proximity to the adjacent rocky shores, the Taputeranga Marine Reserve and other South Coast natural areas;
- Its emphasis on providing interactive formal and informal marine environmental education experiences;
- Its state of the art, habitat-based live displays focussed on Cook Strait's marine bio-diversity which provide direct access to real experience of the seas and marine life unlike any other attraction in New Zealand;
- Its non-profit status and environmental sustainability philosophy of operation;
- Its support of marine research and monitoring programmes, and its conservation advocacy programmes;
- Its celebration and promotion of local history, culture, art, and science that reflect the sites coastal environment.

"Our Ocean Exploration Centre" Exhibit Design

The primary focus of the new "Our Ocean Exploration Centre" will be its exhibits. They will be unlike any others in Australasia and have been designed to allow visitors numerous ways to explore, discover, and interact with live local, freshwater, estuarine, and marine life in naturalistic Cook Strait habitat displays.

The new "Our Ocean" concept's goal of "connecting people to their marine environment" and that all organisms in the sea and on land, including humans, are connected by water, has been expressed in a new exhibit design that links living displays by waterways that flow between exhibits and lead visitors through the Centre.

Although the permanent exhibits will focus on Cook Strait and its connection to the world's oceans, special exhibits may expand beyond the Strait to feature some of the country's incredible marine biodiversity from sub-tropical to sub-Antarctic waters. The exhibits will feature marine plants and animals in their natural habitats in order to communicate the interrelatedness of all life.

The proposed area of paid all-weather exhibit spaces are double that of the previous WMEC design, and over triple that of the new Karori Sanctuary Visitor Centre. The size of the changing exhibit space within the paid exhibits area is three times that of the previous WMEC design and will allow for the staging of significant temporary exhibits.

The final layout of the exhibits and the building design won't be developed and finalised until the next stage of the feasibility study in collaboration with the architectural, landscape, and exhibit design team.

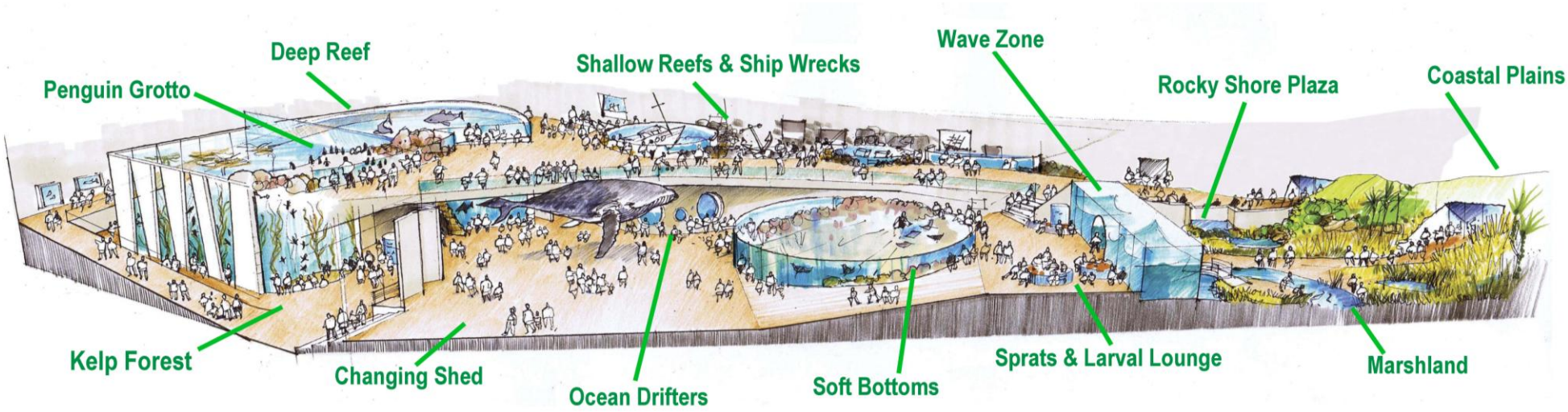
However, descriptions of a possible exhibit layout and artist's impressions of selected habitat displays are presented below. The proposed layout allows visitors to view and interact with the exhibits in a logical sequence of habitats from the coastal plains, through rocky shores or sand beaches into the kelp forests and shallow reefs of near shore waters and out onto the depths of Cook Strait.

Our new layout allows visitors to explore any of the exhibits in any sequence they decide or return to those that capture their interest. Each of the major habitat exhibit areas will have adjacent spaces where visitors will be able to have a variety of hands-on, interactive experiences.

The characteristics of the Maranui site have allowed the design team to develop a preliminary exhibit layout for a facility that will:

- **Be 23% larger than the Te Raekaihau project;**
- **Will have 100 % more exhibit area and more exciting and extensive exhibits than the original design;**
- **Provide much greater opportunities for future expansion at Maranui; and**
- **Will only cost an estimated 10% more than the originally proposed project at Te Raekaihau.**

The Journey- *"From the Familiar to the Unknown and Back!"*



"Coastal Margins" - Life in and around coastal streams-

Coastal streams and their freshwater plant and animal life are an important part of the coastal ecosystems that connect the land to the sea, and their health affects the health and wellbeing of coastal marine waters.

The site's position on the Wellington South Coast will allow the current wasteland area between Queens Drive and the backing escarpment to be developed into the centre's main parking area and will feature a stream and landscaping that recreates a typical South Coast habitat.

The "Coastal Margins" exhibit is centred on an outdoor water feature located at the entrance to TM and is designed to highlight the habitat of freshwater aquatic species found along the coastal margins of the Cook Strait region. The exhibit will consist of an island covered with local coastal stream plant life surrounded by a pool of water.

Visitors can reach the island by a bridge and pass around the planted mound via a path with information plaques describing the ecology of the typical native plant and animal species found in these habitats and some of the threats they face from human impact. A freshwater "stream" would guide visitors from the parking area to the pool and from the pool to the front entrance foyer.

"Marshlands" - Life in brackish water estuaries

Coastal wetlands, mangrove forests and estuaries are very important nursery areas for many shorebird and marine fish and invertebrate species, including numerous commercially important fish and shellfish. Once through the Centre's entrance foyer, visitors would enter a two storey atrium area covered by retractable transparent roofing to shield visitors during rain and allow natural lighting for algal and other plant life.

This light and airy area will reveal the "Marshlands" exhibit area will be a place where visitors can gather, orient themselves, meet friends and family, listen to staff presentations and get advice from volunteers for planning their visit and encounters. Open boardwalks and landscaping will provide an opportunity for visitors to see a selection of New Zealand native fresh and brackish water fish and invertebrates in their natural habitats, as well as examples of how some introduced aquatic life has altered ecological systems and displaced or endangered native species.

"Rocky Shore Plaza" - Life at the land-sea interface

Most people get their first real encounter with marine life at the seashore; whether on sandy beaches or fossicking among the rocks on the rocky shore. The rocky shores of the Cook Strait region are some of the best in New Zealand and are an extremely valuable habitat for both coastal and deeper water marine species.

This exhibit allows visitors an opportunity to see and learn about typical rocky shore marine species and how they affect and are affected by our daily lives. A wide variety of marine plant and animals will live within free-form, large and small, interconnected seawater rock pools situated at various levels leading from the *"Marshlands"* exhibit into the *"Rocky Shore Plaza".*

This area would have a "Touch Gently" pool, where visitors will be able to see some marine life up close and touch them gently, as well as focus aquaria for viewing small intertidal marine life.

"Wave Crash Zone": – Life on exposed shores

Where waves break on sandy beaches and rocky shores are the habitats of uniquely adapted marine life that is not found in the calmer waters of harbours or the offshore depths. This constantly changing zone will be explored in this exhibit and provides a visual link between the turbulent rocky shores and sand bottom bays of the Cook Strait region.

The sound of crashing waves will draw visitors from the *"Marshlands" and "Rocky Shore Plaza"* exhibits and lead them through a clear tunnel under a "Wave Crash" exhibit that displays species living in the surf zone before they enter the *"Soft Bottoms"* exhibit area.

The wave crash zone will be simulated by constructing a clear acrylic tunnel which passes perpendicularly through a large "wave channel" with clear acrylic sections that allow the passing wave to be seen from the marshland and rocky shore areas. The rear of this display will be either solid rock or opaque, sand-etched acrylic lit to create an infinite backdrop to the surf zone.

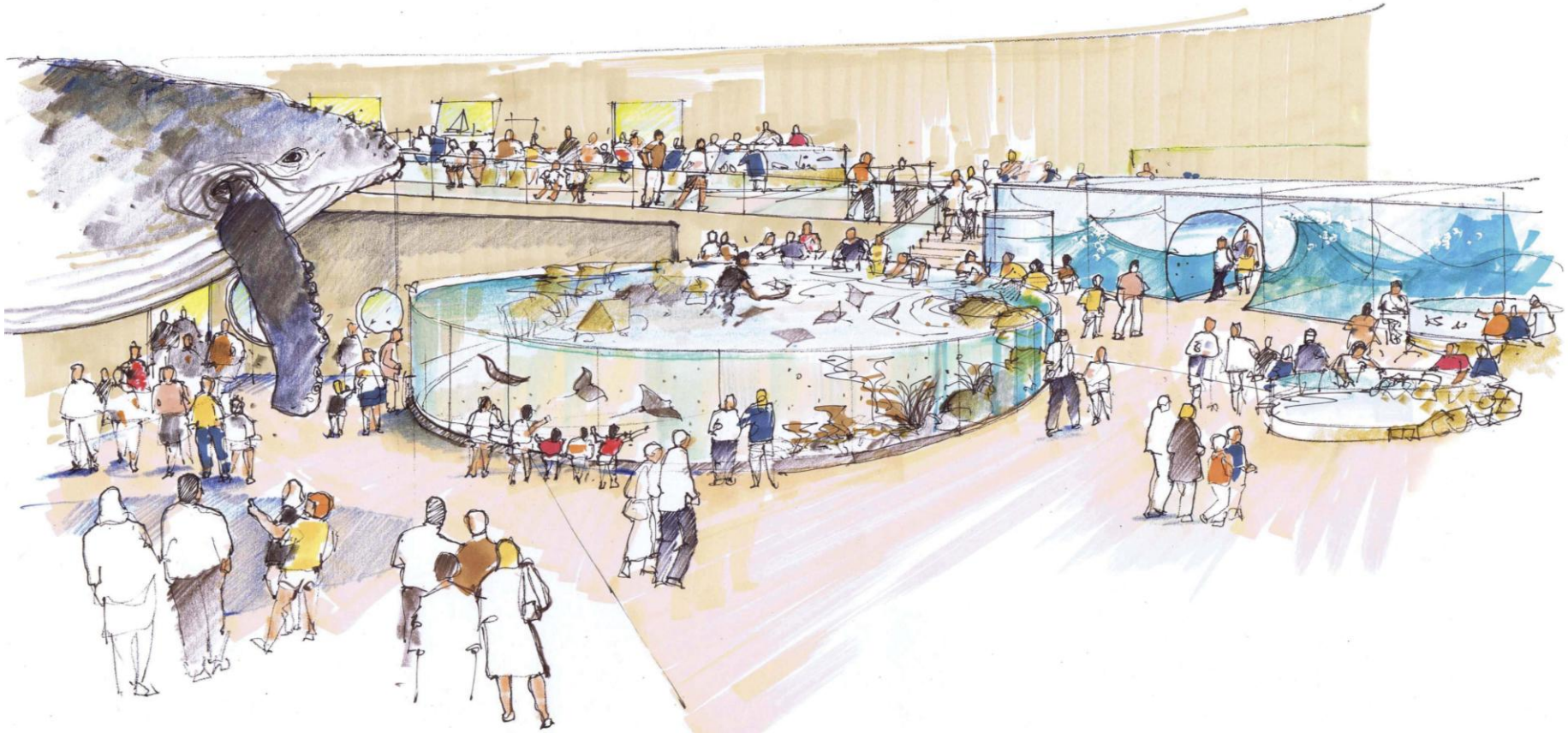
While in the tunnel, visitors will see the wave surge begin at one end of the "channel" and head toward them before smashing up against the perpendicular acrylic face and pouring over their heads to crash onto the other side of the tunnel. This effect should be pretty spectacular and give an exciting, realistic view of the power of the sea and engender respect for those species that have adapted to living in this rigorous environment.

"Soft Bottoms": Life in and on soft sediments

Sandy beaches and soft substrate marine areas are important areas for many unique types of marine fish and invertebrate species that are adapted to this ever shifting habitat. They are also essential breeding and nursery areas for a wide variety of commercial and recreational fish and shellfish species

Animals and plants that live on sand and muddy substrates in the Cook Strait region will be featured in this exhibit and displayed in ways not easily seen even by divers. The exhibit will be a visual extension of the "Marshlands" and "Rocky Shore Plaza" exhibits and will highlight those fish and invertebrate species such as skates, rays, gurnard, flat fish, cat sharks, elephant fish and invertebrates that commonly inhabit sand bottoms.

Smaller live and interactive displays in an adjacent area will feature some of the less commonly seen marine life found in sandy areas such as tube anemones, stargazers, ghost shrimp, sand dollars and many others. As part of this exhibit, a special "touch gently" area will allow visitors to interact with live dogfish, cat sharks and sting rays while learning about their habits.



"Ocean Drifters": Jellyfish and other planktonic life

Plankton is the source of all life on earth. It is the basis of the entire ocean food web from larval fish to blue whales and humans and explores and explains the importance of plankton to our daily lives and how we can all help to protect these essential species.

After exploring the *"Soft Bottoms"* exhibit, visitors can continue their journey by following a water path and entering an acrylic tunnel through a specially designed tank filled with moon jellyfish which will surround them as they walk through into the *"Ocean Drifters"* gallery.

This gallery will have a series of live and interactive displays including video microscopes showing living local plankton, discovery panels exploring the variety and importance of plankton to all life on earth including our connection to these species, and focus aquaria with a number of diverse marine species which feed on plankton.

"The Deep": Life on Cook Strait's deep reefs

Many commercially important marine fish species are found on the deep reefs of Cook Strait but these reefs are also home to a wide variety of other marine life that may contribute to the continued sustainability of these offshore ecosystems.

This 6 m deep is the Centre's second largest and simulates a slice through one of the deep reefs of the Cook Strait and highlights marine life commonly found below 30 m depths on the rocky reefs and sandy plains in Cook Strait. The displays will let visitors come face to face with some of the large fish commonly found on these reefs such as school sharks, groper, and trumpeter as well as numerous invertebrates.

Visitors will be able to view these species from several areas around the exhibit as well as from the inside of our clear acrylic "Underwater Cave" where they will be surrounded by large, bottom and free swimming fish species. Sleep-overs in the "Underwater Cave" and "Diving into the Deep" experiences will be value added attractions.

Live and interactive displays focussing on some of the more bizarre species found in Cook Strait such as hagfish, ghost sharks, spider crabs and other species rarely seen will be located at the two entry points to this exhibit.

"Forests in the Sea": Life in coastal kelp gardens

Kelp forests are extremely important marine habitats as both essential nursery areas for a wide variety of fish and invertebrate species and for protecting adjacent coastline from erosion. Giant kelp beds are the home for numerous marine plants as well as hundreds of marine animals, many of which are not found in other habitats.

Usually only divers are privileged to see and appreciate the amazing beauty of the living forests of kelp in our near shore waters. This exhibit gives everyone of any ability the opportunity to see these "forests in the sea" close up and learn about the myriad marine life that depend on their continued existence and health. Divers would also have the opportunity of diving into the Kelp Forest exhibit as an exciting and educational, value-added experience.

This is the Centre's largest display and features a 1 million litre, 8m deep living kelp forest habitat that can be viewed through the tallest acrylic window in the Southern Hemisphere. Visitors will be able to stand or sit in front of this swaying, living forest and see and learn about the wide variety of fish and invertebrate species commonly found in kelp forests and watch a small colony of resident Little Blue Penguins swimming and feeding at will among the kelp plants.

"Penguin Grotto" – The home of little blue penguins

Little Blue Penguins are an iconic and respected resident of the Cook Strait region. However, their continued well-being is often threatened by introduced predators, commercial fishing pressures, habitat destruction, and human error.

The top of the kelp tank will be open to the sky to provide natural light essential for the health of the kelp forest and visitors will have a bird's eye view of the gentle rising and falling kelp plants as they look into the depths of this exhibit from above.

An adjacent area at the top of the kelp tank will be home to a small group of Little Blue Penguins which will be able to move into and out of the kelp forest to swim and feed at will.

This exhibit gives visitors a chance to see them up close and watch them as they roost and feed in order to appreciate their beauty and gracefulness in the sea and to learn about their habits and life histories.

"Sprat Spot" and "Larval Lounge" – Pre-school activity area and caregiver rest zone

We've learned that pre-school and junior aged children are like little "sponges" readily absorbing information if presented in an exciting and fun manner. We believe that if these future voters can learn about marine life in a fun and age-appropriate setting they will want to learn more as they grow and will be able to make better decisions about conservation issues in the future.

Specially designed hands-on, immersive display areas where under-six year old children and their caregivers can explore marine exhibits and activities together have proven to be extremely popular in other marine education centres and public aquaria.

We have designed a very special area that would be themed and scaled for this special age group and possibly be located adjacent to a small café and rest zone where parents could easily watch their children discover live marine life and learn about and enjoy water-based displays. This special activity zone could be included within the *"Shallow Reef and Shipwreck"* zone or as part of the *"Marshlands"* exhibit area.

"Shallow Reefs and Shipwrecks" – Life and wrecks on shallow reefs

Shallow reefs are one of the richest and most diverse habitats in New Zealand; home to thousands of marine plant and animal species. They are also the cause, and sometimes the final resting place, of hundreds of ships wrecked in the turbulent waters of Cook Strait.

This exhibit focuses on the marine life typically found on shallow rocky offshore reefs less than 20 m deep in Cook Strait and some of the shipwrecks that are part of the maritime history of this region.

The exhibit will integrate actual artefacts from famous local shipwrecks within live displays of marine life in naturalistic settings. The displays will use both live and interactive, hands-on exhibits to explore the intimate connection between our maritime history and our local marine environment.

"The Changing Shed": Changing exhibit area

This exhibit space will house temporary (6-18 months), paid and unpaid displays either developed in house or on loan from other centres. One potential idea for the first of the changing exhibits could be "New Zealand's Marine Treasures" celebrating the marine biodiversity of our Exclusive Economic Zone and its protection in four representative Marine Reserves between the sub-tropical Kermedec Islands and the sub-Antarctic Auckland Islands.

Other smaller, short-term temporary exhibits could also be located in this area which focussed on giant squid, sharks or seahorses and their relatives, deep ocean life, sustainable fishing, and special exhibits provided by Crown Research Institutes such as Geological and Nuclear Sciences, NIWA, etc or partner organisations (WCC, GWRC, Forest and Bird, WWF etc).

At this stage of exhibit layout, the *"Changing Shed"* area could be located in the open space between the *"Soft Bottoms"* display and opposite the *"Ocean Drifters"* area. At 400m^2, the size of the changing exhibit space within the paid exhibits area is three times that of the previous WMEC design and will allow for the staging of significant temporary exhibits.

The Site

The Wellington South Coast is ideally positioned to be the location for an outstanding centre of this kind. Bounded by Cook Strait, the region has some of the richest and most diverse marine and coastal environments in New Zealand.

Cook Strait is unique in New Zealand and the world. It is an important marine mammal and migratory fish passageway between the Tasman Sea and the Pacific Ocean, and a meeting place, where marine life from both North and South Islands occur together.

It is also bounded by two deep oceanic canyons descending to depths of more than 3,000m within close proximity to the coast and with marine life that includes the world's largest recorded giant squid and many other marine plants and animals that are not found any where else in the world.

Those of us who live in Wellington sometimes forget how lucky we are to have not only a beautiful Harbour, but also a fantastic natural resource on our South Coast and in Cook Strait where marine life found nowhere else draws scientists from all over the world.

Few regions in the world have such a relatively unspoiled natural resource so close to their urban centres and the new "Our Ocean Exploration Centre" will be imbedded in this natural coastal area so visitors will be able to connect what they see, experience, and learn at the Centre, with what they see in the immediate environment.

Physical Characteristics

Location:

The Maranui Depot site is located at 370 Queens Drive in Lyall Bay, is owned fee simple by Wellington City Council and is zoned Outer Residential. The site is designated as Lot 1, DP 396447, and has an area of 1.8455 hectares and lies to the north of Queens Drive, Lyall Bay.

This site offers approximately 8000 m^2 of flat / gently sloping land suitable for development which is 60% greater than was available at Te Raekaihau. The usable site area has a long frontage along Queens Drive and rises between 6 - 10 m above MSL which is 4 - 8 m above extreme seawater levels predicted by NIWA. The balance of the site is steeply sloping rising to approximately 55 m above MSL.

Geotechnical & Geo-environmental:

The key findings of MWH New Zealand's preliminary assessment of the ground conditions at the site are:

Slope Stability / Landslide Hazard

Wellington Regional Council Hazard maps for the area indicate a high slope failure potential for the steep natural and cut slope hill portion of the site.

However, based on their site observations and review of previous reports, it is considered that the slopes at the site have minimum potential for long term instability or deep seated slips.

MWH have recommended the creation of a "no-build" buffer zone at the toe of the cut slope and to avoid any building development on the steep natural hill slopes. These measures are considered sufficient to contain any debris from slope failure arising from moderate to severe earthquake.

Debris from the slope are not expected to affect the whole, or even most, of the site and an appropriately dimensioned buffer zone has been included in assessment of building siting options.

Founding Conditions

Within the low lying, flat area of the site there are two layers of fill overlaying natural soil and bed rock. These fills comprise an upper layer of un-compacted Greywacke rock sourced fill derived from the Moa Point Wastewater Treatment Plant construction, and a lower layer rubbish fill. These fills are not considered suitable for founding of any building structure or slab on grade construction as they do not have adequate bearing capacity and may undergo significant settlement due to the loads from the building floor and aquaria water tanks.

MWH have considered a range of options to address the inadequate site founding conditions and have recommended the use of support piles embedded into underlying rock or natural ground. Appropriate allowances for piled foundations have therefore been included in the building capital cost appraisal.

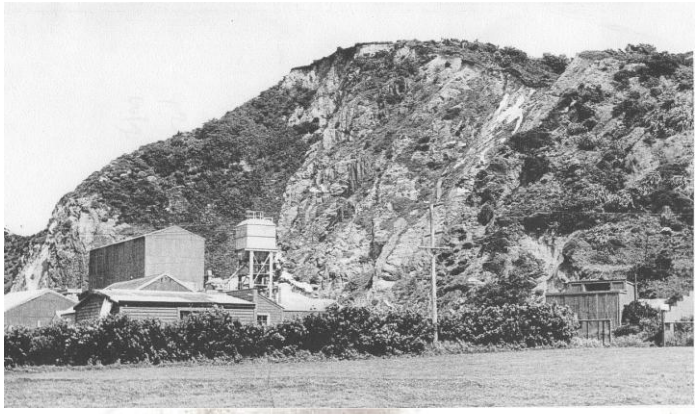
Land Contamination

Findings from two previous environmental investigations undertaken on the site in 1999 and 2002 confirm that historical uses of the site have left a legacy of significant contamination of the underlying ground.

MWH have evaluated the laboratory test results obtained in the 2002 study against current Ministry for the Environment guidelines for contaminated sites and the risks to Human Health arising from anticipated site uses involved with the Marine Education Centre concept.

They advise that contaminant levels for arsenic, copper, lead and petroleum hydrocarbons are such that site contamination remedial measures need to be undertaken to make the site suitable for use.

Although the site investigations conducted by MWH identified some geotechnical and geo-environmental challenges that must be addressed, the overall results of their preliminary investigations indicate the site offers several infrastructural and location advantages to deliver the new project concept, and that it is physically suitable for the construction of the new concept's "Ocean Exploration Centre."



Architectural & Landscape Concept Design

Architectural design undertaken by Athfield Architects has been limited to the development and appraisal of options for building massing and siting within the approximately 8000 m^2 flat area of the site.

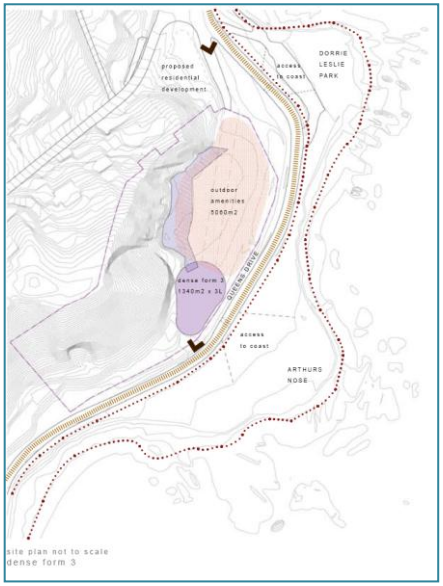
This has involved the development of two building form models, one a dense (higher) form confining the facility's floor area to a smaller site coverage foot print of 1350 m^2 and the other, a low form of occupation with a site coverage of approximately 2000 m^2. A total of six options for building siting, (including site vehicle access and outdoor amenities space requirements), have been explored by Athfield's.

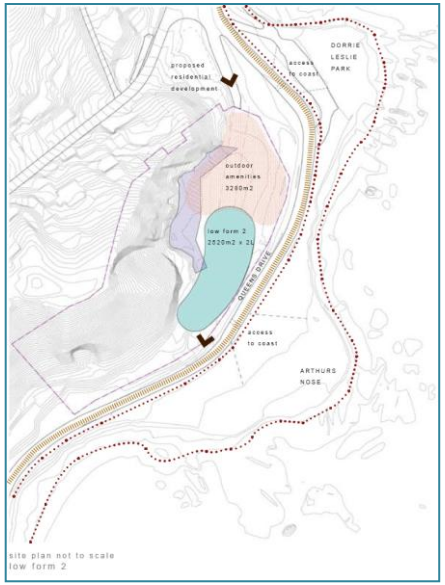
Matters considered for all options included:

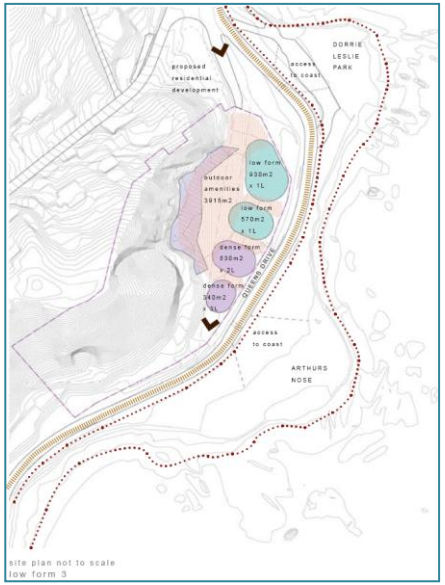
- Landscape relationships, built and marine environment proximity.
- Access to sunlight
- Geotechnical and soil contamination influences
- Vehicle access & circulation
- Availability of opportunities for future complimentary development / use of the site

These appraisals have identified that occupation focused on the southern portion of the site will better deliver the Trust's objectives for the "Our Ocean" concept and will ensure that the facility location is perceived by visitors as being located within Wellington's wild and natural South Coast.

Both a dense form and a low form massing option have been selected as the preferred arrangements to be explored in the next stage of feasibility assessment. A third option being a variation on the low level/large footprint concept and involving a "community" of separated building sites interspersed with outdoor amenities/landscape will also be considered as it may better lend itself to a staged development.







Landscape Assessment

Wraight and Associates have undertaken a preliminary broad scale and intermediate scale assessment of the site's landscape characteristics and its association with the Wellington South Coast environment.

Their analysis has shown that the site sits at juncture between an urban "built" and a "wild" environment. While both the site and Arthurs Nose are highly modified, the strength of the intermediate and broad scale natural South Coast landscape attributes available at the Maranui site afford opportunities for the adverse modifications to be managed through detailed landscape and architectural design.

Views from the elevated Maranui site are expansive and look out over Lyall Bay towards the Harbour entrance and further east along the characteristic South Coast headlands to Baring Head. The unimpeded view to the southeast is directly towards the nearby rocky shores of Te Raekaihau and out across the Pacific Ocean towards distant Antarctica.

Further, their investigations indicated that the elevated Maranui site was more suitable for the proposed new project concept and that it would be both physically and visually more intimately connected to the natural aspects of the South Coast and Cook Strait marine environment than Arthurs Nose.

The site has good access to adjacent rocky shore habitats, offshore waters and coastal walkways. Rich and diverse rock pools are located to the north and south of adjacent Arthurs Nose, and the site is within a short walking distance to Te Raekaihau's rock pools and the Taputeranga Marine Reserve.

Most importantly, there is an extensive kelp forest located just offshore and easily visible from all parts of the site. The visual presence of this kelp forest habitat will certainly enhance the "learning connection" between the new Centre's main live "Kelp Forest" display and the surrounding environment.

The site also has sufficient area for expected parking demand, for coastal plant restoration and landscaping, and for future expansion of the proposed centre and/or to accommodate strategic partner facilities.

Fundamental to the "Our Ocean" concept is that it's wider marine conservation and education goals are delivered in the context of a uniquely Wellington South Coast story. Accordingly, an appraisal of Wellington South Coast natural character attributes exhibited at the three preferred siting locations has also been completed by Wraight & Associates to ensure that the location of the built facility will be recognisable and experienced as part of the wild Wellington South Coast.

This has included appraisal of the potential effects on perception of Wellington South Coast natural character should the building be sited out onto to Arthurs Nose. The overall landscape appraisal has concluded:

- The northern portion of the site is more visible from Lyall Bay than the southern portion which has better opportunities for physical and visual connectivity to the rocky shores leading to Te Raekaihau Point.

- The profile and grade of existing capped landfill on site presents opportunities for the adverse effects of other landscape modifications to be managed through detailed design. Both siting and form will be important for connecting to the natural elements in and around the site and should be further explored in the design phase.

- The site's geological features (i.e. quarry and rocky shore formations) present opportunities for connections between the site and the seashore which can be explored in detail design and artefacts on site present opportunities for interpreting changing cultural/natural relationship of the South Coast.

- For connectivity and story telling, two crossings from the site to the sea shore offer more potential than a single crossing. Further options for bridging, tunneling or at grade crossing will be explored in the next design phase.

- 'Undergrounding' of existing power cables along Queens Drive should be of high priority.

- Siting the new Centre on the seaward side of Queen's Drive does not present any significantly better opportunities for an improved relationship to natural character, visitor experience or story telling than siting within the legal boundary of the site. In fact, the farther one goes out onto Arthurs Nose the uninterrupted expansive and natural outlook to the south is diminished by the visually intrusive housing development in Waitaha Cove.

Coastal Connection & Traffic Engineering

Traffic Concepts Limited have undertaken a preliminary assessment of traffic and the preferred dual coastal pedestrian access requirements, and consider that it is possible to safely achieve the desired connections with the use of at-grade pedestrian crossing arrangements incorporating localised road widening, median refuges and landscaping.

They have noted that the northern vehicle access to the site (Hungerford Road) is a reasonably complex intersection and believe that the traffic flows accessing the site here will necessitate the upgrading of the existing Hungerford Road / Queens Drive intersection, possibly to a roundabout. Indicative costs for these measures have been discussed with Traffic Concepts and appropriate allowances incorporated in the capital cost appraisal.

Maori Cultural Issues

Details of the "Our Ocean" concept and preferred facility siting options have been provided to Mr Morris Te Whiti Love of Raukura Consultants who has prepared a preliminary assessment of the site's Maori cultural significance and a response to the proposal on behalf of:

- Wellington Tenths Trust
- Port Nicholson Block Settlement (Taranaki Whanui ki te Upoko o te Ika)Trust
- Te Atiawa ki te Upoko o Te Ika a Maui Potiki (Fisheries) Trust

The key preliminary findings are:

- Sites of significance to Maori have been identified within the proposed site:
  - M86 Waitaha - A kainga or pa was located at the Western End of Lyall Bay (Queens Drive), near the former quarry. There was a small stream nearby.
  - M87 Unidentified terraces - possible terracing above Arthur's Nose, suggests occupation over a wider area, but probably connected with site M86.
- The Trusts support the "Our Ocean" concept and the education objectives embodied in this proposal and as a place to provide information to the people of Greater Wellington and visitors from within New Zealand and overseas about the very significant flora and fauna of te Moana o Raukawa (Cook Strait). Visitors to the new Centre will be able to learn about the use of these resources and their connection with populations from the earliest Polynesian explorers to the many iwi that lived in or around Wellington's South Coast as well as to the modern people of the region.
- The proposed project concept is in keeping with the traditional historical and cultural heritage of the area and no significant Maori sites would be adversely affected. For example the stream that supplied the ancient Pa site may well have held populations of the freshwater indigenous fish such as the eel/tuna, lamprey/piharau, kokopu and others.
- The Our Ocean Exploration Centre will focus on sea flora and fauna in the displays, but will also feature those species which spend at least part of their life cycle in freshwater. Although outside the newly gazetted Tapu te Ranga Marine Reserve, it is close enough to provide some very useful interpretation of what people would see in the Marine Reserve if they were to dive into those waters.
- The site is appropriate for the proposal, is in keeping with traditional historical and cultural heritage of the area, will not adversely affect any significant Maori sites and is worthy of further detailed investigation.

The Business

Capital Cost

Woods Macaskill Consulting Limited's current capital cost appraisal assessed potential costs for the delivery of the proposed new development to be $27.925million (2009 dollars), inclusive of contingency risk allowances, but excluding GST, escalation and site remediation). Their assessment is summarised in the following table and below.

ELEMENT	COST	COMMENT
Land	Nil	Land provided at no cost to project
Base Building Construction	$9,674,000	Includes piling for soft site conditions
External Works / Landscaping	$2,275,000	Site remediation excluded
Fees	$2,442,000	Professional fees and consents
Base Building Subtotal:	**$14,391,000**	
Facility Fitout	$816,000	Fittings, furnishings and equipment
Marine Life Support System	$3,483,000	Includes sea water intake/ discharge
Exhibits	$9,235,000	Includes design and project management
Fitout Subtotal:	**$13,534,000**	
Total:	**$27,925,000**	
Total Contingencies Included:	$4,030,000	

- Appropriate building construction cost budgets have been established to guide future design development through assessment of an appropriate cost per square metre to be applied against the gross floor area of the building defined in an accommodation schedule developed in conjunction with the Trust.
- Woods Macaskill has drawn on published industry elemental rates for comparable building types and separate allowances were made for site and building purpose specific requirements in their assessment.
- The budget includes allowances for hard and soft landscaping within the site and for planting of the area of coastal open space land, (known as Arthurs Nose), opposite the southern portion of the site.
- Cost estimates for both Marine Life Support Systems and specialist aquaria exhibit fit are based on the concept exhibit design and include sourcing of pricing information from offshore specialist acrylic and equipment suppliers.
- External work allowances were also included for traffic and pedestrian access requirements.

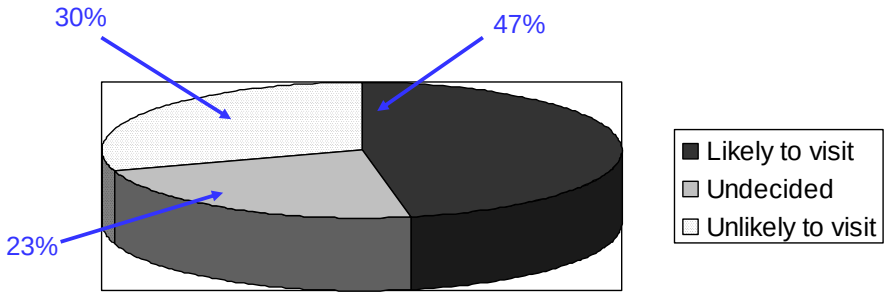
The Market

The "Our Ocean" project concept and rationale, and the assessed capital cost shown in the above table, has guided the market demand projections, the construction costing, management structures, financial projections, funding and economic impact assessment undertaken by McDermott Miller Strategies. Their results are summarised below.

McDermott Miller believe the vision, goal and objectives for the new Centre indicate that it will have a dual role, as both a centre for conservation education and as a visitor attraction. They consider these are complementary roles; the OEC will attract a "serious leisure" audience who enjoy learning through their leisure activities. Children and young people who visit with their classes during formal education activities will return with their families.

The conservation education market has two broad components: "formal" education market of classes of school/tertiary/preschool groups as part of their curricula; and, "informal" education market of those who visit as a leisure activity.

Data from a recent McDermott Miller nationwide survey indicates that around 24% of respondents were already aware of the new marine education centre and aquarium on the Wellington South Coast, and that 47% were likely to visit the Centre once it is established and operational.



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Source: Wellington Marine Education Centre Survey

Conservative visitor projections show between 180,000 to 211,000 people should visit the Ocean Exploration Centre (OCE) in its first full year of operation, rising to around 220,000 by year five.

Around 41-42% of these visitors are likely to be Wellington residents, 34-36% visitors from elsewhere in New Zealand and 22-25% could be international visitors

McDermott Miller's preliminary market and financial assessment indicates in principle that:

- The OCE's dual role as a conservation education centre and as a visitor attraction are consistent with mainstream thought on the proper role of aquariums and zoos.
- There is considerable potential for the OEC to build on the base of Wellington Marine Conservation Trust's current formal conservation education activities at the Island Bay Bait House and Surf Club buildings.

- The impulse for life-long learning among the "serious leisure" group will generate growing market demand for visiting the OEC to participate in WMCT's associated conservation and learning activities

- The combination of formal education and demand for informal conservation education will result in repeat visitation, leading to lifelong learning.

- There is evidence that conservation education at zoos and aquariums can effectively support lasting, positive changes in attitudes and behaviour towards ecosystems.

- There are economic benefits associated with such changes that can and should be valued.

The Feasibility

McDermott Miller's opinions arising from this pre-feasibility study are:

- The OEC would meet a marketing opportunity for a marine conservation and education attraction in Wellington which would accrue, if operated successfully, social and economic benefits for Wellingtonians and other New Zealanders.

- The OEC can be operationally feasible on the basis of the assumptions used in this study, at around 180,000 paid admissions in its first full year of operations and a yield of around $12.00 per admission. We refer to this case as the "base case", and "operationally feasible" means generation of a positive cash flow from operations (ie. before depreciation).

- This base case rests upon conservative projections of future visitation (180,000 pa) and yield per admission ($12.00). At this level it could generate net additional economic benefits of around $1.7-$1.8 million pa for Wellington City and $0.7-$0.8 million for the national economy.

- More optimistic projections of visitation (211,000) and yield per admission ($13.20 to $15.00) lift the projected performance to fully self fund (including depreciation) the Centre by the third year of full operation.

- However, WMCT is not likely to be able to fund the proposed $27.9 million capital cost as it stands. An alternative funding strategy is required.

- The project has greatest chance of successful implementation through a Public-Private Partnership between Wellington City Council as property and building owner, WMCT, (or its successor), as operator of the OEC through a majority owned subsidiary, and the private sector as investors in WMCT's operating subsidiary.

- A Public-Private Partnership requires professional and effective governance and operational management working to a sound business plan and marketing strategy to successfully run this proposed major marine educational and conservation asset and tourist attraction. In these circumstances, a soundly funded OEC is likely to be financially feasible without the support of external operating grants after its initial establishment phase.

- The above findings support undertaking a full feasibility study.

The Next Steps

As part of the pre-feasibility study, the Trust sought a review of potential funding and organisation structures that would best be able to deliver the completed Centre and successfully operate it in the future. McDermott Miller carried out this work and their results are summarised below.

Public-Private Partnership

Four broad structural options were assessed:

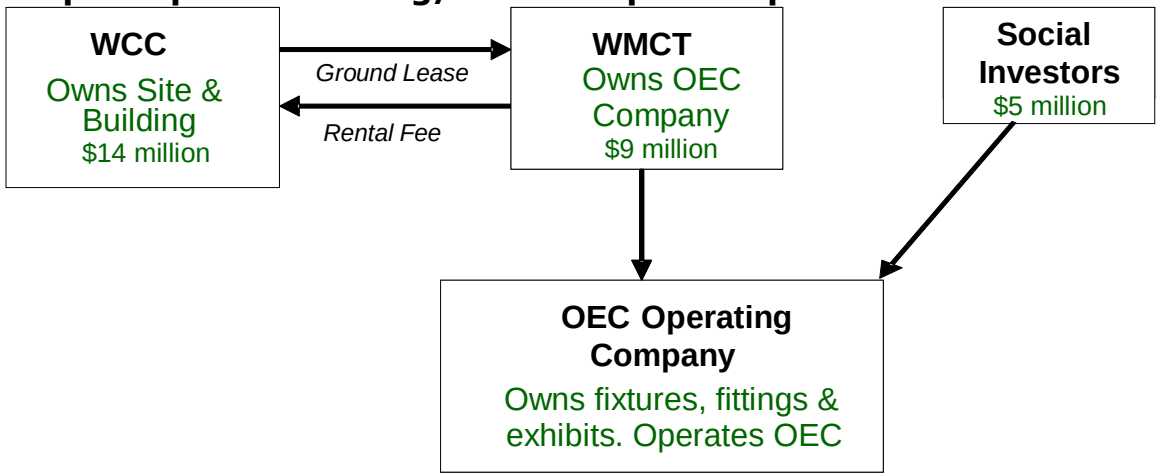
- Public-Trust ownership as was proposed for the Wellington Marine Education Centre at Te Raekaihau.
- A restructured Public-Trust ownership, with Wellington City Council owning the site and the building.
- A new Public-Private Partnership model.
- Public ownership by WCC, with Council owning all assets and the Trust managing and operating the OEC.

The Trust agrees with McDermott Miller's conclusion that the project has the greatest chance of successful implementation through a Public-Private Partnership between Wellington City Council as property and building owner, the Trust as owner and operator of the OEC through a majority or wholly owned subsidiary, and the private sector as investors in the OEC operating subsidiary.

The Public-Private ownership option is the most inclusive from the point of view of key stakeholders and maximises access to local, national, public and private funding. The figure below illustrates the ownership concept of the public-private partnership.

The figure below illustrates the funding and ownership concept of the public-private partnership.

Public-Private Partnership: Proposed Funding/Ownership Concept



Sources: Modified from McDermott Miller

Key Features

Wellington City Council owns the site and constructs the building required to house the OEC. Council leases the site and building for a term of say, 50 years to the Trust for an agreed rent.

The Trust secures funding from Central Government, NZ Lotteries Grants Board and other public funders to capitalise its operational subsidiary to procure the fixtures, fittings and exhibits contained within the building and on the site.

Private investors provide one-third (or other appropriate proportion) of the OEC operating subsidiary capital requirements.

The operating subsidiary then builds and owns the fixtures, fitting and exhibits in the OEC. The operating subsidiary would employ staff and manage and operate all the activities at the OEC and at the Bait House and the Island Bay Surf Club under the governance of the Trust.

Key Benefits

For the Trust

- The OEC would become a real partnership between the public and private sector, rather than being almost entirely dependent upon the public sector, as the Current Proposed option envisages;
- As a result there should be private as well as public sector push, as funders and directors, to make "Our Ocean" an operational success;
- Greater surety of funding, reducing the pressure on WMCT to raise funds from sources other than Wellington City Council and its private investors;
- Control of the operation remains with WMCT.

For WCC

- Control of the construction programme for the OEC;
- Ownership of the building in lieu of a limited recourse loan to WMCT and therefore having a real physical asset on its balance sheet rather than a conditional financial asset;
- Greater ability to protect community interests through its ownership as well as through its representation on WMCT;
- A rental yield provided on its investment in the building.

Governance and Management

The Trust acknowledges that the Public-Private Partnership proposed by McDermott Miller will require professional and effective governance and operational management to successfully run such a major marine educational and conservation asset and tourist attraction. We believe our new Trust Board Board must:

- Have a clearly articulated mandate encompassing the environmental, social, and financial objectives.
- Consist of the right mix of individuals, skills and experience to deliver on the mandate.
- Be guided by best-practise governance conventions including rotation and re-election processes for directors.
- Include representation from Council, tangata whenua, private investors and other major stakeholders.
- Be publicly accountable and transparent.

To ensure these requirements are met, we will seek a board of a maximum of nine directors with the following set of skills and experiences:

- A professional independent chairperson.
- Finance – A director with relevant professional financial experience.
- Operations – A director with extensive management or governance experience of a comparable attraction.
- Marine Science and Research – A professional marine biologist with expertise in marine conservation research and public education.
- Marine Conservation Education - A director with extensive marine conservation education experience.
- Marketing – A director with extensive marketing experience who will have oversight of revenue optimisation and fundraising.
- Maori and fishing industry – A director representing Maori interests and aspirations and with fishing and/or aquaculture industry.
- A Council appointed director.
- A director representing private sector investors.

All directors would be subject to the approval of the rest of the board and other stakeholders. The board of directors will be responsible for the search for and appointment of a Chief Executive for the OEC operating subsidiary who will be a director on the board.

We envisage a transitional phase of board capability development occurring through the early phases of the OEC so as to see the full board in place 2 years prior to the opening of the OEC.