

create an EMP that will adequately address the issues. We are not prepared to effectively transfer responsibility for this crucial area of assessment to a delegated officer of the respondent.

[223] At the heart of the issue is the concept of adaptive management, which is what the parties have generally had in mind when debating some uncertainties of effects in the case.

[224] The concept of adaptive management has developed through a number of decisions of the Environment Court, for instance, *Golden Bay Marine Farmers v Tasman District Council*<sup>17</sup>, *Clifford Bay Marine Farms v Marlborough District Council*<sup>18</sup>, and *Lower Waitaki River Management Society Inc v Canterbury Regional Council*<sup>19</sup>. The concept has arisen in a range of situations, often involving uncertainties about potential impacts of proposed mussel farms, but including in the recent Lower Waitaki decision, issues of riverbed geomorphology and riverbed vegetation.

[225] The problems of modelling ecological responses to changes in conditions introduced by new technologies for water management regimes have led to the use of the technique, very often through the imposition and subsequent refinement of management plans of various kinds.

[226] Important in the design of such management plans is the collecting of baseline knowledge upon which management plans can build in an on-going and cycling process. Steps have been identified in some such plans,<sup>20</sup> that involve setting objectives, design and planning for management of the resource, the managing of the resource, monitoring, evaluation of monitoring results, reviewing and refining hypotheses, the management plan and programme to better meet the objectives. After that point the process will often start again at the design and planning level.

[227] We have deliberately stressed the setting of objectives, because, as was said in the Lower Waitaki River decision, the Court will always be careful to ensure that the objectives for adaptive management are reasonably certain and enforceable, and

<sup>17</sup> W19/2003 at [405] and [407 – 408]

<sup>18</sup> C131/2003

<sup>19</sup> C80/2009

<sup>20</sup> See for instance [381] of the *Lower Waitaki River* decision.



sometimes will call for further detail in draft management plans so as to be reasonably confident of their success.

[228] We are mindful of the findings of the court in *Director General of Conservation v Marlborough District Council and Ors (Clifford Bay)*<sup>21</sup>, that we should not place the applicant in the position of having to have carried out all necessary research before making an application or before a hearing by the court, simply because it is seeking a privilege from the Crown. It would be unfair and unreasonable to hold that an applicant must try to anticipate and research all hypotheses that may occur to someone during the course of an application process<sup>22</sup>.

[229] The converse is that the applicant must establish sufficient of a case to persuade the court to grant consent on the basis of allowing the adaptive management processes to be embarked upon. That is, the court must be satisfied that the environmental management plan can operate in a way that will serve the purpose of the Act.

[230] We will now offer detailed comments on the latest draft conditions of consent. We will preface our remarks by commenting that the critical area in our view is found in conditions 44 – 48 of the resource consents, leading to the setting up the EMP. In particular, as will have been observed from another part of the this decision, the major concern for us in this case is the North Island/West Coast fishery stocks, and in particular, snapper.

[231] We will start with the Restricted Coastal Activities, and then move to the matters the subject of the general consents.

### ***Draft Recommendation to the Minister of Conservation***

[232] Introduction (01) The co-ordinates in the draft consent may need to be updated to contain the latest co-ordinates, be they from Exhibit 4, 4205D, or from whatever source. We require them to be cross-checked and mapped as part of the condition. Our earlier comments about moving the northern boundary of the western array have relevance here.

<sup>21</sup> C113/2004

<sup>22</sup> See [40] of that decision.



[233] Introduction (02) The proposal for two arrays should probably be spelled out. There is also a transmission cable connecting the two arrays. This should be referred to throughout the conditions to ensure all necessary steps are taken in relation to it, including burial, navigation constraints, and the like.

[234] Condition 1, second paragraph We are concerned about the suggested means of resolving internal inconsistencies by a presumption that the document which is the most recent in time and/or the most specific, will prevail. What would occur if a document which is most recent in time is the more general? We are also concerned at the Advice Note suggesting that the documents referred to in Condition 1 “include” those on the list. An exhaustive list would appear to be called for.

[235] Condition 4 First, we are presently uncertain about the desirability of the first stage comprising 20 units, or instead 3 units as may be funded by the 2008 Government Grant, or something in between. There may be a need for evidence about the pluses and minuses of establishing differing numbers between 3 and 20. At the present time, virtually all we have to go on is an assertion by Crest that less than 20 might not be commercially viable. An impression that we have is that the more that are established in the first stage, when least is known about effects, the harder it would be for the consent holder to face any emerging reality of necessity for removal, should that prospect arise. On the other hand, we recognise that it might be argued that the Stage 1 turbines should be of sufficient number to ensure that meaningful or measurable effects are observed by the end of that stage. There might also be the added consideration as to whether the first stage turbines should be installed across the flow rather than in line with it so as to better model the barrier effect. The same consideration could also apply to the number and alignment of turbines in the subsequent stages. All of this points to the need for more evidence on the numbers and alignment of turbines in each stage of the installation programme.

[236] The Advice Notes on condition 4 are appropriate, and have importance in relation to matters in Section 132(4) of the Act concerning the potential for consent to be cancelled. The Advice Notes however need to be extended to make reference to the North Island/West Coast fishery. The phrase “*uncertainties available*” is inelegant.



[237] Conditions 5(a) and (b) These conditions should also refer to fish generally, and in particular, juvenile snapper, given the importance of the latter to the North Island/West Coast snapper fishery.

[238] Condition 7 We remain concerned at the reference to “*unacceptable adverse effects*” which is not a term encountered in the Act, and would seem unacceptably vague. It would probably be preferable to refer to “*more than minor*”, and/or to effects identified in various stages of the EMP. There should probably also be a reference to the inter-array cable. We suggest as well cross-referencing to Condition 32 (which itself needs to do more than refer to “*inaccuracies*” but include omissions and more importantly lack of scientific knowledge).

[239] Condition 8 What is meant by the “*provisional generation array area*”?

[240] Condition 9 The authorisation should, for clarity, also refer to the extent to which the Harbourmaster authorises navigation limitations pursuant to bylaws and the Local Government Act.

[241] Condition 10(b) Once again, the western array co-ordinates may need to be checked and updated.

[242] Condition 11 Plan 4205D is not attached. That should be undertaken, and it should be amended to show the inter-array cable as well its other detail.

[243] Condition 12 Plan 4205E is not attached, but should be. Once again, we do not understand the reference to the term “*provisional*”.

[244] Condition 15(b) There should be reference to the inter-array cable.

[245] Condition 17(a) Engineer-certified appears unnecessarily vague. A relevant qualification could be specified. For instance, CPEng or equivalent.

[246] Condition 21 After “*has been provided with*”, add “*and approved*”.



[247] Conditions 26 & 27 The obligations should probably be bonded in the manner of Conditions 75 and following in the NRC consent, or at the very least there could be suitable cross-referencing.

***Draft Regional Coastal Consent***

[248] Title This should be amended to show that the decision has been made by the Environment Court on appeal from Northland Regional Council.

[249] Condition 1 We consider that the phrase “*in general accordance*” implies too much flexibility. The word “*general*” should be deleted. Once again, the list of documents in the Advice Note should be listed exhaustively, not inclusively. We do not understand the term “*provisional*”, this time found in the first bullet point of the Advice Note.

[250] Condition 2 The somewhat general content of this condition is understood in light of the evidence, but it could probably be expanded by inclusion of a rather more detailed description, such as that found early in this decision.

[251] Condition 5 Same comments as for Condition 4 of the Recommendation for the Minister of Conservation.

[252] Condition 6 Same comment as for Condition 5 of the Recommendation.

[253] Condition 8 Same comments as for Condition 7 of the Recommendation. Also, Condition 8 should be expressly linked to the review in Condition 7 to provide better context.

[254] Condition 9 Once again, the issue about “*unacceptable adverse effects*”.

[255] Condition 10 Once again, the issue about “*unacceptable adverse effects*”. Also, we wonder at the reference to “*installation proposal*”, in comparison to “*proposal*” in the third line of Condition 8. Should they not both be the same, and record “*proposal and/or installation process*”?



- [256] Condition 10A In (a) and (b) there should presumably be a reference to cables where plural.
- [257] Condition 11 Need for a check on co-ordinates.
- [258] Condition 12 The plans need attaching. We consider that the word “*generally*” can remain in this particular Condition.
- [259] Condition 14(a) The party undertaking the review should first be approved by NRC. Again, there should be a reference to an appropriate engineering qualification.
- [260] Condition 14(b) The terms “*certified*” and “*for the certification of .....*” , are unclear. That latter should probably be “*approval*”. Is the term “*certified*” linked to Advice Note 2? Clarification is probably necessary. The July 2007 Section 92 document listed in Advice Note 1 should probably also be added to the list in the Advice Note Condition 1.
- [261] Condition 19(e) The “*suitably qualified persons*” should be subject to approval by NRC. Once again, a benchmark qualification should be specified.
- [262] Condition 21 Add at the end “*or adverse effect*” on the environment.
- [263] Conditions 23 & 24 Is “*ballast*” the material to be placed to prevent or mitigate scour? Greater clarity might assist.
- [264] Condition 29 Attach the plan, and again, we query the use of the term “*provisional*”.
- [265] Condition 30 Cable marks will probably also be required at either end of the Tikinui-Raupo crossing.
- [266] Condition 32(d) What does “*additional*” mean?
- [267] Condition 35(d) The condition should suggest the time in which the council is to receive the explanation (see by way of example, Condition 42(d)).



[268] Condition 36 “Suitably qualified and experienced person” could be tighter, and “approval by NRC” added. “Unwanted or risk species” should probably be generically identified by reference to authoritative, published materials. (The same issue arises in Conditions 37 & 38).

[269] Condition 44 This area of monitoring is key to the question of whether consent can be granted. Conditions 44 – 48 do not seem to express matters with adequate certainty as to what the EMP is to cover. Conditions 44 – 48 in the First Schedule may be reasonably certain in themselves, but the other references seem to provide a recipe for uncertainty. Work is needed to tighten these provisions up.

[270] Condition 45(d) Definition of “acceptable vs unacceptable effects” seems to be the very thing that Mr Bell, counsel for NRC, asserts cannot be done satisfactorily. Further, there could usefully be cross-referencing to the draft EMP, where the particular topic of interest for the Court is potential effects on fish stocks, spawn, spawning, and juvenile fish.

[271] Condition 46 We consider that related matters in this list should be grouped together so that a coherent overview is possible. Also, we are somewhat mystified by absence of reference to fish stocks in the above terms, even though it might be inferred that items (c), (d) and (l) refer to the topic somewhat indirectly. It also occurs to us that it might be necessary to monitor effects on juvenile snapper beyond the harbour entrance. We query the use of the term “provisional” in item (t). Item (v) seems extremely broad, but perhaps something of that nature is necessary in circumstances where new outcomes or even new science might emerge from ongoing monitoring steps.

[272] Condition 47 There seems to be something of a muddle as between Condition 46 and Condition 47. For instance, how does 47(c) differ from 46(m)? If Condition 47 comprises “matters of the highest priority”, we consider that it should include fish, and in particular, snapper.

[273] Condition 52 Again, we are concerned at the absence of mention of fish species, particularly snapper, in the first of the two bullet points towards the end of the Condition.

[274] Condition 55 As for Condition 52.



[275] Condition 56 The condition implies a period of monitoring after the commencement of each deployment stage, but fails to specify one.

[276] Condition 57 This is not particularly well integrated with Condition 54, or at all. Could the two conditions be usefully combined?

[277] Condition 58 This should include provision for necessity of cable repair at times.

[278] Conditions 67 and 68 These are also key provisions in our view. Subject possibly to further evidence, twelve months may be an inadequate period of time for base monitoring, as we have discussed elsewhere in the decision<sup>23</sup>. The condition as drafted also presupposes that the approval of the draft EMP will be left over to the respondent or a delegated officer, and as we have also held elsewhere in the decision, that is not appropriate.

[279] Conditions 72 – 74 We have commented earlier on the slightly unclear basis for the establishment of this trust, which seems to have a particularly broad objective “*to provide environmental benefit to the Kaipara Harbour community*”. It seems that the payments intended are for some form of environmental compensation, slightly ill-defined. We infer for present purposes that they are for occupying harbour space and limiting navigation, albeit to what we consider to be a minor degree. It seems to us from the evidence that in the course of moving from stage to stage the consent holder will be substantially increasing the body of scientific knowledge about the harbour, and thus make significant social and economic contributions to the local community. We infer that the condition is put forward as an additional “sweetener”; that is, it has the appearance of comprising the basis of a settlement with some party or parties opposing. If so, it may be appropriate to note that the condition is offered on an “Augier” basis.

[280] Condition 75 – 84, and Schedule 2. There appears to be a certain amount of repetition, overlap, and some potential for inconsistency, as between the conditions and the schedule. A simpler approach might be to have one condition referring to a comprehensive schedule. The contents of Conditions 80 & 82 could be combined to

<sup>23</sup> See paras [108] to [119].



ensure that it is understood that they concern the same subject matter. It is not understood what is meant by “*registration*” in Condition 81.

[281] Condition 85 This provides for what appear to be discretionary reviews under Section 128 of the Act. It should be recalled that Condition 7 also relates to the topic of reviews, that is, compulsory reviews between staged deployments. A cross-reference in Condition 85 to Condition 7 would assist reading and recall. The mechanisms involved in Section 130 of the Act should probably be mentioned in Condition 7.

### ***Draft Environmental Monitoring Plan***

[282] Introduction Appendices A and B have not been written. Consequently, references to them, such as are found in the Introduction, are nugatory. Appendix B is intended to set out information on the existing Kaipara Harbour environment. We would have imagined that that should have been informed, at least, by the intended pilot survey. We will have more to say about the timing of the intended stages of the EMP.

[283] Section 2.1 & 2.2 The proposed pilot survey is “*to define the components of Baseline and Operational Monitoring ....*”. We note in particular Objective 3 in Section 2.2: *To provide evaluation criteria and data for use by the consent authority for determining the acceptability of environmental effects associated with the project.* This seems to us to be confirmation of our concern that, to put it colloquially, the cart has been put before the horse. The criteria and data obtained from the pilot survey will ultimately be critical to the Adaptive Management outcome. Until the pilot survey is undertaken, objectives set, and evaluation criteria framed, we do not feel sufficient confidence that the Adaptive Management regime will be appropriate or satisfactory. Further, there is a disconnect between what Objective 3 is said to derive from, and the wording of Condition 45(d) in the draft conditions. The condition is said in 2.2 to read “*technical criteria to assist the consent authority in its determination of the acceptability of environmental effects associated with the project*”, whereas all it says is “*definition of acceptable vs unacceptable effects*”. Quite apart from the critical need for consistency between the conditions and the draft EMP, this tends to demonstrate that if matters were left as currently drafted, critical information about potential effects on the environment is not being adequately addressed at the present time.



[284] Section 2.4 (last sentence) The EMP is said to provide criteria that the consent authority may apply when considering the deployment of successive stages. We consider that this discretion should be removed, but scope left for the addition of further criteria to be added, as the state of knowledge advances.

[285] Section 3.2 We infer that Figure 3 probably started life as a coloured drawing. From the black & white copy provided it is difficult to see where the 8 Pilot Survey samplings are proposed. A single round of fish/megafauna sampling and 5 replicates. As the figure doesn't cover much of the harbour beyond the entrance, presumably no sampling is proposed in the arms or inter-tidal areas. We wonder whether this may limit the potential to investigate spawning grounds. Other sites (three) are to be established in nearby parts of the Hokianga Harbour for use as control or reference sites. Given the preponderance of West Coast/North Island snapper juvenile originating the Kaipara, we have a concern about whether this part of the proposal is adequate.

[286] Section 3.4 Distribution and abundance of fish are to be determined using "*sonar devices*". Can these differentiate between species? Are the proposed 8 sampling sites adequate? Over what time periods is this evaluation to occur? Will it relate to spawning times and/or times of adult return to the harbour? As to the proposed marine mammal surveillance from an elevated position on the North Kaipara Head, we consider from the evidence that this has an element of futility about it, and we wonder about its necessity.

[287] Section 3.5 (Data Analysis) It seems to us to be appropriate for there to be a peer review of project design and statistical evaluation of biological data by the named senior academic. We are however concerned at the expression "*as appropriate*" concerning qualitative data, because much of the data appears to be potentially in this category, and it is not clear whether the peer review was to include the qualitative component.

[288] Section 4.1 (Baseline Introduction) This schedule of key components introduces considerable, but possibly unavoidable uncertainty. It occurs to us that this is particularly a product of the pilot survey not yet having been carried out, which we think is a concern. Key components of the Baseline and Operating Monitoring Study include "*fisheries resources and commercial fishing*" as set out in Table 2. That table tells us that commercial fisheries are to be baseline monitored annually across the deployment area



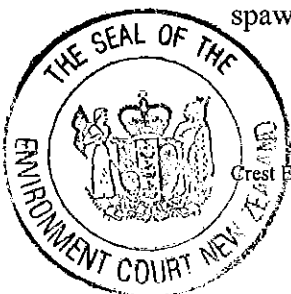
using catch per unit effort, tag and recapture, “*sample parameters*”. Based on the outcomes, various EMP elements may need to be extended to further far-field monitoring sites within the harbour, however, there is no present indication of this and we are concerned as to whether annually is sufficiently frequent to disclose any relevant seasonal and/or life-cycle effects. The baseline sampling has been set “*provisionally*” at 12 months for the purposes of the draft EMP, the actual period to be “*defined in resource consents granted for the project*”. Subject to any further evidence that we may need to hear, it might be that two, or three, years might be necessary for baseline monitoring in relation to fish and fisheries.

[289] Section 4.3 This gives methodologies for various subjects. Before – After – Control – Impact (BACI) Monitoring is proposed for benthic biota, benthic sediments and water quality, which seems suitable. An important aspect is stated to be an attempt to ascertain naturally occurring variability. Quarterly monitoring is proposed, which seems in some contrast with the proposed frequency in relation to fish. Is this because benthic animals are more easily sampled, and methods better understood than for wet fish? Evidence might be necessary.

[290] Noise - Section 4.3.2 There is a reference to a Section 5.2.3, but the version provided to us does not have one.

[291] Section 4.3.3 (Marine Mammals) Following Stage 1 deployment, it is proposed to “*explore the use of underwater cameras mounted on a turbine*”. “*Explore*” is somewhat equivocal, and if there were to be an adverse effect post-deployment, might that be too late? We also wonder whether cameras could be used to monitor other species such as snapper. Evidence might be necessary.

[292] Section 4.3.5 (Fisheries Resources and Commercial Fishing) In the first sub-paragraph we are uncertain what “*review*” means in this context. Is it desktop, in the field, or both? What would “*spawning requirements*” cover (ability of adults and juveniles to swim past turbines safely in either direction)? It seems that fish samples wouldn’t be collected if the near field weren’t identified as an area important to spawning. Again, there is uncertainty. The near field may be unimportant in terms of where spawning physically occurs, but important in the sense that fish need to be able to navigate through it. In the second sub-paragraph we question absence of mention of spawning seasons. If a “*season*” weren’t identified, would recreational fishers go



unmonitored? Is an explicit BACI component required to establish what proportion of adults are spawning prior to and post-deployment, with reference to a controlled site, if relevant? All things being equal, that might allow conclusions to be drawn about the effect of the deployment? In the third sub-paragraph the approach for commercial fishing may be appropriate, but it is not clear over what area commercial fishing data is to be collected. Is not the whole West Coast/North Island snapper fishery potentially affected? How robust is the catch per unit effort concept? What is the intended unit? In a multi-variable equation, how does one identify cause and effect? Should the NIWA research be continued, funded by the consent holder, to determine if the number and proportion of Kaipara snapper and the total catch are maintained? In relation to the fourth sub-paragraph, it is appropriate that juvenile snapper are specifically addressed. Is it relevant to acquire about whether one should distinguish a migratory snapper from a non-migratory snapper? Or do they all migrate? What does “*confirm recapture rates*” mean? Is it intended that a proportion of in-harbour fish be tagged and compared with the proportion of tagged emigrating fish recaptured outside the entrance past the deployment? If so, could the same thing be done for in-coming fish? Once again, far greater emphasis would seem to be needed at the Pilot Survey stage, with a requirement that it be concluded before a decision is made as to whether to grant resource consent. Further, should there be a qualitative aspect to the monitoring to gather anecdotal evidence from commercial fishers (similar to 4.3.7 for recreational fishers)? Further, we note as a positive that a side-scan sonar and video technology are to be used to monitor behaviour of fish in proximity to deployed units. Evidence on these several sub-topics seems called for.

[293] Section 4.4 (Evaluation Criteria) No quantitative measures are given, notwithstanding that for some matters, for example water quality, this would appear relatively straight-forward. Similarly, no qualitative measures are given for matters like effects on recreational and commercial fishing and effects on marine biota. There does not appear to be an express requirement for NRC to sign off on the criteria, although Conditions 59 & 60 may assist? Referring back to those conditions, we approve of the provision in Condition 60 for the NRC to seek expert advice from a third party on the adequacy of the “*fleshed out*” EMP, but we consider that to be far too late in the process, particularly with the Pilot Survey work having not been undertaken as yet.



### Conclusion

[294] We have called quite extensively for Crest to prepare further evidence on some matters, and undertake significant revision of the draft conditions of consent and the EMP. We imagine that it will want to work collaboratively with some other parties, particularly the council. To the extent that it does not do so however there must be adequate opportunity for evidence and input from other parties, and it goes without saying that even parties that work collaboratively may wish to file evidence.

[295] Crest is to consult the other parties and prepare a timetable from here, for the Court's consideration. A judicial conference can be sought if necessary. The Court will offer every realistic opportunity for the earliest possible final resolution of the case.

[296] Costs are naturally reserved at this time.

DATED at Auckland this *22<sup>nd</sup>* day of December 2009.



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L J Newhook  
Environment Judge

