

# Confirmed Coastal Hazard Risk Indicators

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*Cover Photo: Mt Maunganui Beach. S Park - Environment Bay of Plenty.*



## Executive Summary

Environment Bay of Plenty's Regional Coastal Environment Plan contains a chapter on managing coastal hazards and sets up a policy framework based on the objective of:

*"No increase in the total physical risk from coastal hazards."*

Monitoring method 12.2.1 in the regional coastal environment plan requires Environment Bay of Plenty to measure:

(iii) *Change in the intensity of subdivision and structural development in known coastal hazard areas.*

Section 35 of the Resource Management Act requires the regional council to monitor the effectiveness of policies, rules and methods contained in regional plans and keep records of natural hazards to the extent appropriate for the effective discharge of its functions.

To this end, a project to develop indicators to measure the coastal hazard risk was initiated in 2003 to provide information in order to meet Environment Bay of Plenty's policy and legislative monitoring requirements.

Environment Bay of Plenty staff in association with planning consultants Hill Young Cooper Ltd and technical coastal consultant Jim Dahm (Eco Nomos Ltd), developed a set of proposed indicators (Hill Young Cooper, et al., 2003). After an initial consultation workshop with Bay of Plenty coastal territorial Councils in 2003, a pilot trial of the proposed indicators was initiated in 2004 with the objective of testing if the proposed indicators were workable. The results of the trial were collated and reported in the Coastal Hazard Indicators Pilot Report in 2005 (Gordon et al., 2005). The trialling of the indicators showed that there were some difficulties with collating the data required for the indicators and a number of the indicators were found to be unduly complex. It was also found that the wide variation in coastal hazard zone methodologies used by coastal territorial Councils in the region has caused some difficulty when undertaking a comparative regional analysis of trends.

A review of the proposed indicators was carried out by the staff project team and consultants. The outcome of this review work has resulted some reworking and refinement of the proposed indicators into a simplified core set of seven coastal hazard risk indicators (CHRI):

- CHRI-1** Have coastal hazard zones been identified and included on district planning maps?
- CHRI-2** Are there district rules to support those hazard zones and are these aimed at not increasing physical risk of coastal hazards? (this may include no-subdivision rules and building setbacks)
- CHRI-3** Are there administrative or district plan policies to ensure that any building within the coastal hazard zones is subject to controls to mitigate risk such as relocatability and relocation management plans?
- CHRI-4** Average building set back for the most seaward residential dwellings on residential lots in coastal hazard zones from the year 2000 toe of foredune survey line datum.
- CHRI-5** Number of residential dwellings in the coastal hazard zones at the date of the most recent aerial photography.

- CHRI-6** Number of residential lots in coastal hazard zones from the DCDB at a date close to the most recent aerial photography.
- CHRI-7** Percentage of new residential dwellings within coastal hazard zones subject to resource consent with building relocation conditions.

The set of seven indicators above are considered by the project team to be sufficiently robust to be practically implemented into Environment Bay of Plenty's regional monitoring programme.

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## Chapter 1: Background

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Environment Bay of Plenty's Regional Coastal Environment Plan contains a chapter on managing coastal hazards and sets up a policy framework based on the objective of:

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(iii) *Change in the intensity of subdivision and structural development in known coastal hazard areas.*

Section 35 of the Resource Management Act requires the regional council to monitor the effectiveness of policies, rules and methods contained in regional plans and keep records of natural hazards to the extent appropriate for the effective discharge of its functions.

To this end a project to develop indicators to measure the coastal hazard risk was initiated in 2003 to provide information in order to meet Environment Bay of Plenty's policy and legislative monitoring requirements.

Environment Bay of Plenty staff in association with planning consultants Hill Young Cooper Ltd and technical coastal consultant Jim Dahm (Eco Nomos Ltd), developed a set of proposed indicators (Hill Young Cooper, et al., 2003). After an initial consultation workshop with Bay of Plenty coastal territorial Councils in 2003, a pilot trial of the proposed indicators was initiated in 2004 with the objective of testing if the proposed indicators were workable. The results of the trial were collated and reported in the Pilot Report of Proposed Coastal Hazard Indicators in 2005 (Gordon et al., 2005). The trialling of the indicators showed that there are some difficulties with collating the data required for the indicators and a number of the indicators were found to be unduly complex. It was also found that the wide variation in coastal hazard zone methodologies used by coastal territorial Councils in the region caused some difficulty when undertaking a comparative regional analysis of trends.

A second consultation workshop was convened with coastal territorial Councils to discuss the findings of the Pilot Report of Proposed Coastal Hazard Indicators on 10 October 2005. A full copy of the workshop minutes is presented in Appendix 1. The objective of the workshop was to progress finalising a set of indicators that could be practically implemented. The consultation workshop with coastal territorial Councils was considered an important process because a number of the indicators relied on data sourced from district councils. However, only representatives from Tauranga City Council and Western Bay of Plenty District Council were able to attend the workshop. Despite the low attendance, significant progress was made refining the proposed indicators during the workshop. It was generally agreed at the workshop that there was some duplication and overlap with a number of the proposed indicators. There was also general agreement that the indicators needed to be simplified. Further final comments on the trial report were sought from the district councils by 28 October 2005. Written comments were received from Tauranga City Council (Appendix 2).

Hill Young Cooper Ltd also conducted a peer review of the Indicator Trial Report in November 2005 and recommended that the indicators should be simplified. A full copy of the peer review is presented in Appendix 3. It was also noted by the reviewer that the Bay of Plenty region has a very well developed resource management regime for the management of coastal hazards and that implementing a monitoring regime represents an advanced stage of the planning cycle. The reviewer also commented that there are significant challenges to managing coastal hazards in the Bay of Plenty region because there are a number of developed coastal settlements where there is ongoing pressure to permit further intensification of the existing developed areas.

## Chapter 2: Review of Proposed Indicators

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A number of implementation issues were identified with the proposed coastal hazard indicators during the pilot trialling of the indicators and from feedback at consultation workshops with territorial Councils. This prompted the project team to review the proposed indicators to address noted concerns. The coastal indicator project team consists of the following staff members:

- Aileen Lawrie - Senior Environmental Planner (Coastal)
- Shane Iremonger - Scientific Officer
- Dougall Gordon - Senior Environmental Scientist (Coastal Indicator Project Manager).

### 2.1 Foundation Indicators

Foundation indicators were initially designed to assess if appropriate resource management has been implemented at the district plan level. The Regional Policy Statement and Regional Coastal Environment Plan have policies, which require coastal management to occur within the district plans of coastal territorial Councils where coastal hazard risk has been identified.

The foundation indicators are:

- **Indicator F1** Have coastal hazard zones been identified and included on district planning maps?
- **Indicator F2** Are there district rules to support those hazard zones and are these aimed at not increasing physical risk of coastal hazards? (in some areas this will include “no-subdivision rules” and large building setbacks/coastal reserves)
- **Indicator F3** Are there administrative or district plan policies to ensure that any building within the coastal hazard zones is subject to controls to mitigate risk such as relocatability and relocation plans?

From the results of the indicator trial it was found to be relatively easy to identify the information needed to compile the foundation indicators by simply reviewing the relevant provisions in district plans. It was generally agreed at the 10 October 2005 workshop meeting with territorial Councils that the foundation indicators could be implemented as proposed. The peer reviewer also commented that the indicators are simple and useful and should remain without major change. Therefore, the project team recommend that the “foundation” indicators be adopted in their present form with some minor rewording refinement.

## 2.2 Baseline indicators

Six baseline indicators were trialed but only three were considered suitable for implementation as result of the pilot trial:

- **Indicator B1** *Average building set back for residential dwellings in the “primary” hazard zone from the toe of the foredune.*
- **Indicator B2** *Number of residential dwellings in the “primary” and “secondary” hazard zones at the date of the most recent aerial photography.*
- **Indicator B3** *Number of residential lots in the “primary” and “secondary” hazard zones from the DCDB at a date close to the most recent aerial photography.*

These baseline indicators were designed to provide a basis for understanding change in the risk over time. This was to be achieved by providing a numerical starting point that provided a snapshot of the level of residential development already occurring in coastal hazards zones and then repeating these measurements at specific dates to determine change.

As result of the 10 October 2005 workshop with territorial Councils, it was agreed that indicators B1, B2 and B3 could be implemented. However, the peer reviewer recommended discontinuing indicator B1 because of difficulties with establishing a setback baseline, as there is high probability that this would result in measuring the natural changes in the erosion and accretion rather than the target of measuring the actual changes in development setback distance. There were also problems with measuring the set back for properties adjacent to stream mouths that are influenced by stream hydraulic processes rather than coastal processes. These issues were initially identified in the indicator trial report (Gordon et al., 2005).

However, it was agreed at the 10 October, 2005 workshop that indicator B1 is an important method of detecting changes in risk profile and the staff project team concur with this viewpoint. The issue of a measurement baseline can be resolved by adopting the 2000 GPS dune line survey as the baseline datum for measuring setback distances. The issue of measuring setback for properties adjacent to stream mouths can be resolved by excluding properties that are influenced by stream hydraulic processes. These exclusion areas can be defined spatially and included into the methodology. Therefore, the indicator has been amended to:

- **B1** *Average building set back for the most seaward residential dwellings on residential lots in coastal hazard zones from the year 2000 toe of foredune survey line datum.*

Proposed indicators B2 and B3 were identified in the indicator trial and by the peer reviewer as the simplest way of measuring the level of development in hazard zones. These indicators were also generally endorsed at the workshop held on 10 October 2005. However, the merits of measuring hazard risk on a total zone or single zone basis were raised as an issue at the workshop. Methodology issues with separating out and separate reporting on a “primary” and “secondary” hazard zone basis was initially identified in the indicator trial report as a significant problem when interpreting data. This is because territorial Councils in the region have used quite different methodologies for defining hazard zones into gradations of hazard (Gordon et al., 2005).

The Regional Coastal Environment Plan policy does not differentiate between primary and secondary hazard zones. For this reason the reviewer recommended that, indicators B2 and B3 should reflect a total zone approach. The issue was discussed at length at the workshop and the consensus was that “primary” and “secondary” zones should be retained to show the changes in the level of risk. The “primary” zone generally reflects an area that is at greatest risk from current coastal process and the secondary zone reflects an area that is additionally at risk from climate change induced sea level rise effects. The project team identify with both total and single hazard approaches and the project team consider that the indicators can be refined to accommodate reporting both on a single zone or a total hazard zone basis. Therefore, indicators B1, B2 and B3 have been amended to reflect this change as presented below:

- *B1 Average building set back for the most seaward residential dwellings on residential lots in coastal hazard zones from the year 2000 toe of foredune survey line datum.*
- *B2 Number of residential dwellings in the coastal hazard zones at the date of the most recent aerial photography.*
- *B3 Number of residential lots in the coastal hazard zones from the DCDB at a date close to the most recent aerial photography.*

### 2.3 Trendline Indicators

A number of trendline indicators were developed but the effectiveness of the proposed trend indicators could not be easily evaluated during the pilot trial due poor or incomplete information available from territorial Councils. The trend indicators are:

- **T1** Number of residential subdivision consents granted in coastal hazard zones.
- **T2** Number of land use consents granted for residential building in coastal hazard zones.
- **T3** Number of land use consents granted in coastal hazard zones with relocation or setback conditions for residential dwellings.
- **T4** Number of new residential dwellings in coastal hazard zones.
- **T5** Number of new residential subdivided lots in coastal hazard zones.
- **T6** Percentage of new residential dwellings subject to resource consents conditions with relocatability, building setback or coastal erosion monitoring.
- **T7** New physical area of land vested as reserve (m<sup>2</sup>).
- **T8** Average change (increase being desirable) of the setback distance of newly consented residential dwelling compared to overall average and average of residential dwellings they are replacing.

As a result of the indicator trial, workshop with territorial Councils, peer and project team review, it was found that a number of the trendline indicators duplicate most of baseline indicators and were just another way of recording the same information. For example T1 – “number of subdivision consents” provides information about the change occurring for baseline indicator B3. Likewise, indicators T4 and T5 are simply representing information from baseline indicators B2 and B3 but for each monitoring cycle. A degree of redundancy was also identified, as information for indicator T1 is likely to be very similar to T2.

Participants of the workshop considered that indicator T6 was a good measure of the level and strength of resource management control exercised on residential dwellings and provides robust information to assess if the total physical risk from coastal hazards is being managed. However, the peer reviewer has suggested that T6 should be modified simply to show the number of houses subject to resource consent. This is because of the requisite that resource consents would include conditions for; building relocatability and/or building setback and/or coastal erosion monitoring. This was stated by the peer reviewer as; *a level of sophistication that may cause problems with data gathering and may not be appropriate in all cases* (Hill Young Cooper, 2006).

On balance, it was considered by the project team that if the conditional detail is removed from the indicator then the original intent of the indicator would be lost. The intention of the indicator is to show if territorial Councils were using consent conditions to manage the coastal hazard risk. To this end, it was considered by the project team that relocation conditions are the key to managing hazard risk and this should be clearly reflected in the indicator.

The following table presents the results of the discussion on each of the trendline indicators:

*Table 1 Trendline Indicator Analysis*

T1	Provides information about proposed subdivision in the immediate future (that is, consent granted but legal subdivision has not yet occurred). This information is not deemed necessary for understanding long-term risk management of the coastal hazard.
T2	Provides information about proposed residential development in the immediate future (that is, consent granted but construction has not yet occurred). This information is not deemed necessary for understanding long-term risk management of the coastal hazard. This indicator is similar to T1 and T4.
T3	This indicator is a subset of T6. It provides information about residential developments that are consented with conditions but that are not yet constructed.
T4	This indicator reflects the change between two monitoring cycles (that is, the current number of dwellings minus the previous cycle's number of dwellings equals the number of new dwellings). This information is gained through the process of comparing B2 data (for subsequent periods) and is not necessary as an indicator in itself.
T5	This indicator reflects the change between two monitoring cycles (that is, the current number of residential lots minus the previous cycle's number of residential lots equals the number of new residential lots). This information is gained through the process of comparing B3 data (for subsequent periods) and is not necessary as an indicator in itself.
T6	A measure of the level and strength of resource management control is seen as an important aspect of coastal hazard monitoring. However the original indicator needs to be amended to focus on building relocation as the key resource consent condition.

	Amended indicator: <i>Percentage of new residential dwellings within coastal hazard zones subject to resource consent with building relocation conditions.</i>
T7	The amount of land vested as reserve was not seen as contributing significantly to the understanding of risk management in the coastal hazard area.
T8	This indicator reflects the change between two monitoring cycles. It is a comparison between the average setback for the current and previous monitoring cycles. This information is gained through the process of comparing B1 data (for subsequent periods) and is not necessary as an indicator in itself.

For the reasons outlined previously the project team, recommend that proposed indicator T6 be amended as shown for implementation and indicators T1, T2, T3, T4, T5, T7 and T8 are abandoned.

## 2.4 Refined Indicators

As a result of the review process, a number of the initially proposed indicators have been amended or abandoned. To avoid confusion with previous reporting the project team recommend that the confirmed coastal hazard risk indicators (CHRI) be renamed into a set of seven indicators:

- **CHRI-1** Have coastal hazard zones been identified and included on district planning maps?
- **CHRI-2** Are there district rules to support those hazard zones and are these aimed at not increasing physical risk of coastal hazards? (this may include no-subdivision rules and building setbacks).
- **CHRI-3** Are there administrative or district plan policies to ensure that any building within the coastal hazard zones is subject to controls to mitigate risk such as relocatability and relocation management plans?
- **CHRI-4** Average building set back for the most seaward residential dwellings on residential lots in coastal hazard zones from the year 2000 toe of foredune survey line datum.
- **CHRI-5** Number of residential dwellings in coastal hazard zones at the date of the most recent aerial photography.
- **CHRI-6** Number of residential lots in coastal hazard zones from the DCDB at a date close to the most recent aerial photography.
- **CHRI-7** Percentage of new residential dwellings within coastal hazard zones subject to resource consent with building relocation conditions.

The above indicators will provide the following monitoring information (Table 2):

Table 2 Indicator Information

<b>CHRI-1</b>	Identifies if coastal erosion hazard zones for the four coastal territorial Councils are in place.
<b>CHRI-2</b>	Identifies if district rules are in place to support the hazard zones for the four coastal territorial Councils.
<b>CHRI-3</b>	Identifies if policies are in place to ensure that buildings within the coastal hazard zones are subject to controls to mitigate risks for the four coastal territorial Councils.
<b>CHRI-4</b>	Identification of the average setback (linear distance) for all dwellings in the coastal hazard zones from the specified survey line. The average setback can be compared to previous data to show an increase (desirable) or decrease.
<b>CHRI-5</b>	Calculating the total number of residential dwellings in coastal hazard zones. The total number can be compared to previous data to show an increase or decrease (desirable).
<b>CHRI-6</b>	Calculating the total number of residential lots in coastal hazard zones. The total number can be compared to previous data to show an increase or decrease (desirable).
<b>CHRI-7</b>	A number expressed as a percentage - showing the effectiveness of coastal territorial Councils application of consent conditions for new dwellings in coastal hazard zones that mitigate the coastal erosion risk. 100% = desirable.

## Chapter 3: Indicator Data Requirements and Reporting

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From the results of the indicator trial it was found to be relatively easy to identify the information needed to compile data for indicators CHRI-1, CHRI-2 and CHRI-3 by simply reviewing the relevant provisions in district plans. Data needed for indicators; CHRI-4, CHRI-5 and CHRI-6 can be sourced from high-resolution aerial photography. A programme of capturing high resolution aerial along the Bay of Plenty coastline is proposed in the draft 2005 LTCCP for use in the proposed coastal hazard monitoring along with synergistic uses for other Environment Bay of Plenty monitoring programmes e.g., coastal terrestrial ecology and dune care monitoring.

Data for CHRI-7 will need to be sourced from territorial Council resource consent approvals. It was initially proposed that district resource consent approval information would be collated using the new region wide i-share data agreements with territorial Councils. However, this information can be compiled more efficiently from the Environment Bay of Plenty's regional district consents database with the provision of additional new database fields to accommodate compiling of data for the indicator. Therefore, it is recommended by the project team that data collection for CHRI-7 is actioned with the addition of coastal hazard fields to the regional district consent database and that this database needs to be maintained and updated on a continual basis. This may require some updating of the current data sharing memorandum of understanding with the relevant territorial Councils.

Reporting of the indicators was proposed in the pilot trial report to be on a 3-yearly cycle to allow for sufficient time to identify trends and it was also proposed that reporting should coincide with the state of the environment reporting timeframe which is currently every three years. The advantage of this approach is that the holistic picture can be interpreted from reporting coastal indicator data along side the reporting of physical coastal monitoring data. This information is needed to recognise if regional coastal hazard policy is being achieved.

It was suggested by the peer reviewer that the indicators should be reported on a 5-yearly basis with the 2003 reported data set used as the baseline and reporting of the indicators alongside the reporting of the physical coastal monitoring data and state of the environment reporting programme. Likewise the consensus at the 10 October 2005 workshop with territorial Councils was that reporting of coastal hazard indicator data should co-inside with state of environment reporting timeframes. It is understood that both Environment Bay of Plenty and territorial Councils are currently reviewing state of the environment reporting timeframes. The project team recommend that the reporting of coastal hazard risk indicators coincide with state of the environment reporting and that the indicators are implemented into Environment Bay of Plenty's regional monitoring programme.



## Chapter 4: Summary and Conclusions

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Since the initial development of the proposed indicators, considerable resources have been devoted to implementing the proposed indicators to meet Environment Bay of Plenty's Regional Coastal Environment Plan requirements of measuring the change in the intensity of subdivision and structural development in known coastal hazards areas. This information is needed to recognise if the regional coastal hazard policy is being achieved. A pilot trial of the proposed indicators together with consultation workshops with coastal territorial Councils were carried out by Environment Bay of Plenty's project team and consultants. A number of implementation issues were identified with the proposed coastal hazard indicators during the pilot trial and from feedback from consultation workshops with territorial Councils. This prompted the project team to review the proposed indicators to address noted concerns. As a result of this review process, the proposed indicators have now been refined and simplified into a core set of seven indicators.

A core set of seven indicators are now considered by the project team to be sufficiently robust to be practically implemented into Environment Bay of Plenty's regional monitoring programme.



## References

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Gordon D.A, Fraser R 2005: Pilot Report of Proposed Coastal Hazard Indicators Environmental Publication 2005/21. 59 p.

Hill Young Cooper Ltd and Eco Nomos Ltd., 2003: Coastal Hazard Risk Indicators. Report to Environment Bay of Plenty. 77 p.



## **Appendices**

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Appendix 1 – 10 October Workshop Meeting Minutes: Coastal Hazards Management Forum

Appendix 2 – Comments from Coastal Territorial Councils

Appendix 3 – Peer Review Report



## Appendix 1 – 10 October 2005 Workshop Meeting Minutes

### Minutes of the Bay of Plenty Coastal Hazards Management Forum held on Monday, 10 October 2005 commencing at 10.00 a.m.

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**In Attendance:** Grant Bridgwater (Western Bay of Plenty District Council), Lisa Power, Shane Iremonger, Dougall Gordon, Pam Crabbe, Shari Kameta, (Environment Bay of Plenty), David Phizacklea (Tauranga City Council), Chris Staite (Department of Conservation), Adrienne Young Cooper (Hill Young Cooper Ltd)

**Apologies:** Chris Nichols, Chris Farnsworth, Paul Baunton (Tauranga City Council), Aileen Lawrie, Peter Blackwood (Environment Bay of Plenty), David Bewley (Whakatane District Council), Chris Kimpton (Opotiki District Council)

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#### 1 Round Table

##### 1.1 Environment Bay of Plenty

*Lisa Power:* Currently working on District Plan Changes for Western Bay of Plenty's Plan Change 34 (Pukehina) and Tauranga City Council's Plan Change 45.

Have been in contact with Whakatane District Council re their pending coastal hazard plan change but progress on this has been delayed due to staff resourcing, July flood events and Matata disaster. Anticipate a draft early next year. Science from 1999/2000 may need to be reviewed.

Opotiki District Council has contracted consultant (Jim Dahm) to do the hazard analysis and awaiting the final report.

*Pam Crabbe (District Applications Coordinator):* Coordinates resource consent applications that are received from the district and city councils. These are sent around Environment Bay of Plenty staff for comment. Have had several for Pukehina and at Waihi Beach for additions. None received from Tauranga.

##### 1.2 Tauranga City Council

Tauranga City Council has notified Plan Change 45, which is a refinement of the operative coastal hazard management provisions. They received 13 submissions and 21 further submissions. Hearings are scheduled for 3, 4 and 7 (Reserve Day) November 2005. Council and Tonkin & Taylor are checking the methodology used to calculate the amended hazard lines, in particular for three properties where lines have moved landward rather than seaward.

Council has had some issues with property owners and developers believing they can now operate under the new proposed lines, and are applying for resource consent in the extreme risk zone. If there are no appeals, the plan change would become operative in late-March 2006. The hearings committee for plan change 45 comprises Dr Arthur Hackett (ex-Environment Court planning commissioner) and two city councillors.

### 1.3 Department of Conservation

Head Office is currently looking at the NZ Coastal Policy Statement and hope to have something out in November. Chris pointed out that if there is a change in Minister it could possibly change the timeline and/or process.

David noted that he and Aileen are also involved in review team process of reviewing the NZ Coastal Policy Statement. Everyone has a section(s) to look cover. Tsunami hazard has been raised along with Foreshore and Seabed, and AMAs.

### 1.4 Western Bay of Plenty District Council

Currently progressing Plan Change 34 – for Pukehina Beach, aligning rules for subdivision and development that are in the primary risk zone, to align with Waihi Beach.

Next year hope to review the hazard areas and more precisely assess and identify the risk zones. Grant noted that changing the risk lines would have implications for the hazard indicators.

*Dougall, Shane and Adrienne arrived at approx. 10.45 am due to flight delay.*

## 2 Hazard Indicator Workshop

Dougall gave a presentation and overview of the hazard indicator results (PowerPoint attached). The purpose of the workshop is to discuss the results of the indicator trial and confirm suitable indicators for measuring change in development in identified hazard areas.

### Foundation Indicators

Foundation indicators are the basic elements of risk management. Information for the 3 foundation indicators is identified from District Plans. All agreed that foundation indicators are suitable for implementation. These will become less important as all the Districts implement hazards lines, and coastal management policy and controls into district plans.

### Baseline Indicators

Measures the current status in the development. Note that there are different methodologies used in different districts. Note that the B2 indicator is residential lots (not houses). Regional trend indicator results are from 2000-2004.

How often should we measure? There should be one agreed baseline.

- Use a starting point from a particular date to measure change.
- The degree of development change would be a better trend to pickup on.

- Whether it is a vacant lot or not, property owners have a right to develop.
- The baseline indicator B1 building setback may need to be looked at as the monitoring “picture” can be blurred by for areas where there is stream migration.
- How useful are setbacks going to be over time?
- Exclude properties from particular assessment if the influence of stream hydraulic and coastal processes are not clear.
- A monitoring baseline for indicator B1 will be required, e.g. selection of one of the high accuracy toe of foredune surveys (possibly the 2000 survey) could be used as a datum.
- High resolution aerial photography would also need to be taken along the coastal margin for the analysis of B1. Environment Bay of Plenty could fly it on an agreed timeline, but would need a coordinated approach, at least 5 years, and jointly funded a suggestion. David Phizacklea noted that he would be happy with 5 years.
- B2 – suggestion to use rates DCDB data. Same for B6 (RDAM goes to 350m).
- B7 – don’t need ASCH except for Opotiki. Have draft hazards analysis from Jim Dahm’s report. It is understood that “one zone approach” is the favoured option. Opotiki has mostly gravel beaches, so different coastal processes and risk profile.
- Indicator matrix – collating indicator information. Hazard lines and rules, management controls and resource consent. Look at all this information as a package.

### **Setback**

- There is a danger of measuring setback, is confusing if trying to measuring two points. Would need to measure from a fixed point that is independent. Could use 2003 toe of dune line to measure from or the most seaward property (Cadastral boundary).
- No indicators seem to address areas where there is or could be protection works. Perhaps need to consider developing specific indicators for those areas. Coastal protection works will change coastal hazard lines and risk. Noted that seawalls reduce the risk.
- Measure setback to coastal hazard lines, which could change overtime because physical processors will change.
- Need to decide on a baseline as a starting point to enable development changes.
- Monitor baseline indicators every 5 years and trend indicators every 3 years.
- B1 (setback) - need to measure again from same point. Can look at physical point of dune. Will give a good indication of distance gained and of improved condition. Maybe use the year 2000 GPS dune line survey as this has good data from Waihi down to Opape.

It was agreed that indicators B1 (Setbacks), B2 (Number of houses in residential lots) and B3 (Number of houses in primary or secondary risk zones) can be implemented. Indicators B4, B5, B6 and B7 will be set aside.

### **Trend Indicators**

- T6 – is this for new or additional dwellings? Aims to pick up if there are any additional houses in coastal hazard areas, and to find out if there is management of the physical risk without conditions. Replacement dwellings – how do we pick them up? Do we capture replacement back valued at \$1m? Was noted that value is not part of the measuring risk.
- T7 – would need a baseline to measure. Requires a lot of interpretation. Not sure if it tells anything about management of risk and therefore could be discarded.
- T5 – there is an implication in baseline indicator. Not all new development is behind coastal hazard lines.
- T1 – is part of T5 and is included in baseline indicators B3 and therefore both T1 & T5 could be discarded.
- T8 – There is no information that can be provided from resource consents and picked up by baseline indicators anyway and therefore could be discarded.
- T2 – measures the activity and amount of activity but is picked up in baseline indicators and therefore could be discarded.
- Indicator T4 builds on the baseline indicator B2.
- Indicators T3, T6 and T8 have merit but need to be refined.

### **General Comments**

#### **What is the merit of dividing indicator analysis into primary and secondary risk zones?**

- May need to because of the varying methodology, also what happens if actual hazard lines change? Would have to do some interpretation of primary and secondary. In the secondary zones there may be a lot of resource consent controls.
- May have to divide to identify the level of management. It's likely you would see some definite changes for the primary risk zones in a few years, compared to the secondary risk zone.
- David noted it would be important to have the two risk zones.

#### **Are there any issues with the defining of the secondary risk areas?**

- Whakatane – Tonkin & Taylor report has safety factors built in compared to Gibb analysis that has safety buffer at the end. Healy analysis was a one zone that was latter split but is conservative as primary areas have safety built in 2x storm cut erosion + dune stability factor.

- Are the right lines the way to go for hazards zones? Easy to implement planning controls but more difficult to set actual risk based certainty for development.

#### **Issues of the hazard line changing if the baseline moves, and impact of that?**

- TCC Plan Change has hearing next month. Environment Court has removed safety buffer zones and council will be redoing the technical data. Are looking at reviewing hazard zones every 5-years and are proposing current risk zone stay fixed (prohibited status). Other activities are discretionary activities. This will not have a huge impact on the hazard indicator data.
- WBOPDC plan to look at reviewing hazard lines next year.
- Trend data collected every year and reported on every 5 years, with the option to report earlier if major changes occur.
- State of the Environment Report timeframe – every 3 years. For TCC this creates a lot of work so maybe revised. Next one is due for 2007/2008 SOE report. WBOPDC is not sure of timeframes, the last one was done in 1998. Environment Bay of Plenty was every 3 years but this may also be reviewed to 5 years. A lot of work in a short timeframe.

#### **Collecting Data and Reporting**

- Data has been captured through the DAC process.
- iShare – done yearly. TCC has a natural hazard workshop in Nov/Dec, will cover 3-5 indicators but may not pick up on the coastal indicators proposed here.
- TCC uses the Origin system – consent details, S92 with module added to system for land use consent data but not currently being collected. Should be able to run a spatial query. Did not have a lot of data from TCC. Each Council to investigate ability to gather data. David is optimistic it can be done.

**Action: Each Council to investigate ability to gather data.  
Shane will provide a template to assist.**

- Comments on the idea of connecting indicator data with physical processes data. Report on data same time as NERM.
- Whakatane and Opotiki District Councils need to progress getting coastal hazard lines and management controls in place. At the moment coastal hazards are not managed in accordance with coastal plan objective and polices and with the indicators, there is distorted picture for the region. For reporting baseline indicators can use hazards lines from the consultant's report.

Grant and Dougall thanked Adrienne for attending and providing advice on the hazards indicator report. Can use this discussion workshop to refine indicators.

**Action: Dougall to revise Hazard Indicator Report and circulate to each Council for comment.**

**Action: Comments on the Hazard Indicator Report are required back from each Council by 28 October 2005**

### 3 Other Business

#### 3.1 Coastal Hazards Managed Retreat Report

A copy of the Coastal Hazards Managed Retreat Report was distributed to those attending the meeting. If you have any comments on the report please send to Aileen by end of October.

**Action:** Send any comments on the Coastal Hazards Managed Retreat Report to Aileen by end of October.

#### 3.2 Agenda Reports

Grant raised the issue about getting agenda reports/information out to forum members in timely manner prior to meetings. The agenda reports for this meeting were received late on Thursday afternoon via email, and there was not enough time to review them prior to the meeting to allow for better discussion. Would like to suggest that any information must be circulated a week prior to the meeting. All agreed on timeframe.

**Action :** Agenda reports and info for meetings must be distributed one week prior to meetings.

#### 3.3 Meeting Attendance

Grant raised issue that a higher attendance is needed from each council to attend forum meetings. A substantial amount of time is taken out of everyone's day to attend the meetings, for the forum to be beneficial better attendance is needed. It would be helpful if early notice can be provided if members can't attend, so a suitable date can be found for everyone.

**Action:** Forum members to improve on meeting attendance. Please provide early attendance notice (Ongoing)

### 4 Next meeting

The forum would like to hold the next meeting in Whakatane. It was suggested that the next meeting be held at Whakatane District Council.

**Action:** David Bewley to confirm his availability to host and chair the next meeting.

## 5 Summary of Action Items to Follow-up

Action Point	Who
1 Investigate ability to gather data for reporting of hazard indicators.	Everyone
2 Provide a template to assist with hazard indicator data collection and reporting.	Shane
3 Revise Hazard Indicator Report and circulate to each Council for comment asap.	Dougall
4 Comments on the Hazard Indicator Report are required back from each Council by 28 October 2005	Everyone
5 Comments on Coastal Hazards Managed Retreat Report to Aileen by end of October.	Everyone
6 Agenda reports to be distributed one week prior to meetings.	Ongoing
7 Forum members to provide early notice of meeting attendance.	Ongoing
8 David Bewley to confirm his availability to host and chair the next meeting	David Bewley

**Meeting concluded at 1.45 p.m.**



## Appendix 2 – Comments from Coastal Territorial Councils

-----Original Message-----

**From:** David Phizacklea [mailto:DavidP@tauranga.govt.nz]

**Sent:** Monday, 14 November 2005 3:17 PM

**To:** Dougall Gordon

**Cc:** Grant Bridgewater (E-mail); Shane Iremonger; Lisa Power; Aileen Lawrie; Shari Kameta

**Subject:** RE: Coastal Hazards Indicators Review Report from HYC

Hi Dougall

Thank you for forwarding the HYC Review Report, which I have read in conjunction with the excellent minutes of our recent Coastal Hazard Forum meeting.

My comments on the Review Report are as follows:

I generally agree with the reduction in the number of indicators. We discussed refining the list through deleting a number of the baseline and trend indicators at the meeting, which was agreed upon.

Reference to "houses" in the final adopted coastal hazard indicators should be amended to "dwellings" as apartments, units and houses are all contained within the coastal hazard zones. iShare BOP indicators of residential development and Statistics NZ use the term "dwellings".

The third recommended indicator should reflect the original intent of the proposed T6 indicator, as there may be variability across the region and over time with the type of conditions placed on a resource consent. The key issue isn't whether a dwelling has a resource consent, but ensuring that conditions of consent address relocation, building setback, and review.

In looking at the minutes of our 10th October meeting, I thought we had agreed as a forum that the B1 indicator which looks at building setback would remain, with a fixed reference point used over time, and with the reporting of this indicator undertaken in conjunction with coastal processes monitoring in order to discuss relevant changes. The removal of areas that are subject to unknown coastal processes and stream migration influences is acceptable and on that basis I thought there had been some agreement reached between TCC, WBOPDC and EBOP that the indicator has merit and would be kept.

I agree with the 5-year time period for monitoring and the 2003 baseline date for future monitoring. Data can be gathered annually using GIS so that it can be reported on every 5 years, or every 3 years as part of State of the Environment reporting if required.

The minutes reflect our discussion on the one hazard zone versus indicator monitoring for both primary and secondary risk zones. There are obvious pros and cons for both. I reiterate that TCC would prefer to see data gathered for both zones. TCC currently has 3 zones, but the primary equates to the Current Risk Zone, and the secondary to the 100-yr and 50-yr risk Zones in terms of regulatory controls. By having only one zone, and showing for example an increase in lots over time, this would not reflect whether that the subdivision would have occurred in the secondary risk area, and that new lots have required conditions on an Alternative Building Site, relocation and review.

I support the recommended "Index of Risk" proposed by HYC. The formula proposed at page 7 would be more simply:

$(A \text{ divided by } B) \times 100 = \text{Coastal Hazard Risk Index}$

In this regard the formula currently has a "C" rather than "B", and the parameters A and B should be the other way round. The "year #" in the formula is confusing and isn't needed. Again reference should be to "dwellings" rather than "houses". The only question I have with the formula and this also relates to the third recommended HYC indicator, concerns the wording "subject to resource consent conditions". Within Tauranga City's open coastline and under its District Plan, this would include additions to existing houses for relatively minor building work. I therefore suggest that the wording refer to or make note that it "excludes alterations or additions to existing dwellings". The indicator is really applying only to new dwellings, either newly built on a vacant lot or available building platform, or a replacement of an existing dwelling.

In addition there are a few typos in the HYC report:

- p.2, 2nd para., 3rd sentence "The challenges..." the word "ate" should read "are".
- p.4, 3rd para., 3rd sentence "Reporting on the state..." the wording "..at the same time at risk.." should read "..at the same time as risk.."
- p.6, 2nd para., 2nd bullet, the term "district council" should be plural and read "district councils"

I trust these comments are of assistance.

Regards

**David Phizacklea**

Environmental Policy Planner  
Tauranga City Council  
Private Bag 12022, Tauranga

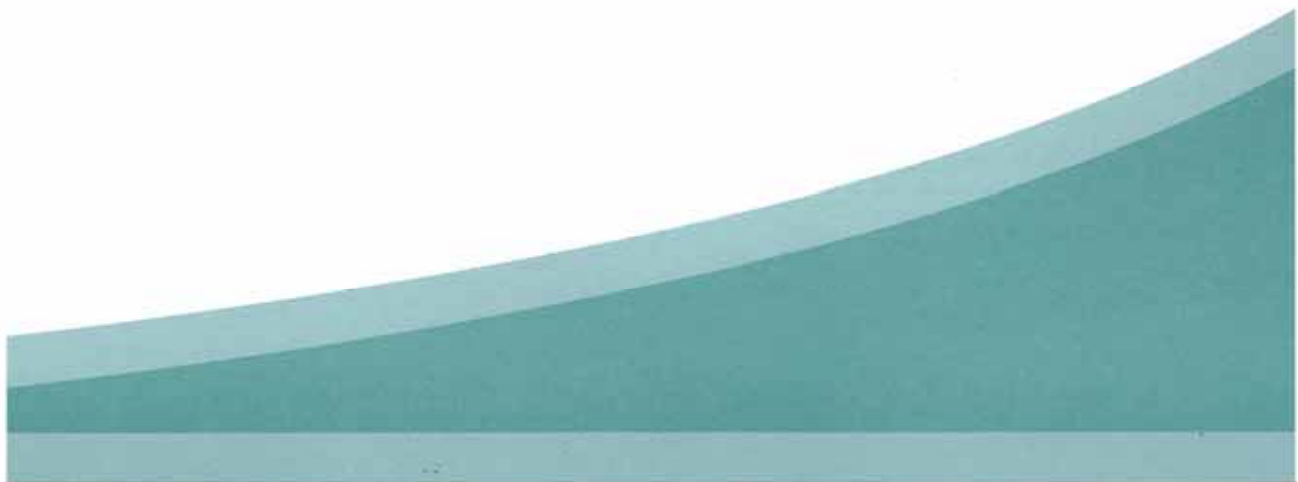
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## Appendix 3 – Peer Review Report





e n v i r o n m e n t s   r e s o u r c e s   f u t u r e s



# Review of Coastal Indicator Trial Report

Report prepared for Environment Bay of Plenty by

Hill Young Cooper Ltd

November 2005



Document Reference : Review of Coastal Indicator Trial Report  
Date of this version: November 2005  
Status of Report: Final  
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# 1 Background

In October 2003 Hill Young Cooper (in association with Jim Dahm of Eco Nomos Ltd) undertook a study for Environment Bay of Plenty (EBOP) on Coastal Hazard Risk Monitoring. A workshop was held with Bay of Plenty District Councils in December 2003, followed by the trialling of the proposed indicators during 2004. The results from these trials have been collated by EBOP into the Coastal Indicator Trial Report.

Stage 3 of the Coastal Indicator Project is about to commence and involves the refinement of the proposed indicators, continuation of data collection (where necessary) and the development of protocols with the District Councils through the IShare programme for the collection of data.

Hill Young Cooper has been asked to comment on the proposed indicators in the final version of the Coastal Indicator Pilot Report. These coastal indicators will be used to measure coastal hazard risk for the Bay of Plenty Region.

# 2 Introductory remarks

Since the completion of the assignment to establish a trial set of indicators Environment Bay of Plenty have devoted considerable resources to implementing the indicators. This is now reported in "Pilot Report of Proposed Coastal Hazard Indicators" dated September 2005. This report was forwarded to and discussed with the region's territorial authorities at a workshop on the 10th of October 2005. This meeting was not attended by representatives of Whakatane District Council or Opotiki District Council. This was unfortunate as there are significant issues with respect to the management of coastal hazards in both districts, and these councils are not as advanced in the implementation of management regimes as Tauranga and Western Bay of Plenty District Councils. No comment on the report has been received from the territorial authorities to the Pilot Report, although useful comment was received at the meeting on the 10th of October.

In general the Bay of Plenty has a very developed resource management regime for the management of coastal hazards. Implementing a monitoring regime represents an advanced stage of the planning cycle. To our knowledge no other regional council in New Zealand has attempted to develop such a sophisticated system of coastal hazard indicators. The challenges of this project are largely caused by the fact that there are significant areas of the Bay of Plenty coastline which are developed as coastal settlements, and there is significant and ongoing pressure to permit the ongoing development of these settlements.

The Pilot Report covers background to the development of the indicators, a report on the methods used and results of the first reporting on the indicators, followed by an evaluation of the effectiveness and issues associated with the indicators.

This report provides additional commentary to that already contained within the Pilot Report on the basis of the indicators.

### 3 Foundation Indicators

The foundation indicators were designed to simply establish that an appropriate resource management is in place at district plan level. The regional policy statement and regional coastal plan have well developed policies which require the fine grained implementation of coastal hazard management to occur at the district council level through district plan controls. The foundation indicators are simple and useful and are generally agreed should remain without change.

**We recommend that the foundation indicators remain.** The occasion of the Pilot Report is a good time to engage with the two outstanding Councils in term of the progress being made to comply with regional direction and include appropriate hazard zones and rules in their district plans.

### 4 Baseline indicators

The indicators used in the trial were:

B1 – BUILDING SETBACKS – the average building setback for houses in the primary hazard zone from the toe of the foredune

B2 - NUMBER OF RESIDENTIAL LOTS IN THE PRIMARY OR SECONDARY HAZARD ZONES – from the DCDB at a date close to the aerial photography date

B3 – NUMBER OF HOUSES IN THE PRIMARY AND SECONDARY HAZARD ZONES – from the same aerial photography identified above

B5 – THE NUMBER OF VACANT LOTS IN THE PRIMARY AND SECONDARY HAZARD ZONES – from the DCDB at a date close to the most recent aerial photography

B6 – NUMBER OF DEVELOPED LOTS IN THE PRIMARY AND SECONDARY HAZARD ZONES – from the DCDB at a date close to the aerial photography.

As a result of the Pilot Study, our review and the 10th October workshop some rationalisation of the baseline indicators was generally agreed.

The purpose of the baseline indicators was to provide a numerical starting point that provided a snapshot of the level of residential development already existing in the coastal hazard zones at specific dates. There is considerable duplication in the baseline indicators in the measuring of total lots, houses, developed lots and vacant lots. It is our view based on the Pilot Report and comments and review, that B2 (total residential lots) and B3 (total houses) are the most straightforward indicators by which to measure the level of development within the coastal hazard zone. **We recommend that only these two baseline indicators are retained.**

Both B2 and B3 will change over time as a result of increased subdivision and development of lots and because of hazard lines moving. Of themselves B2 and B3 are not the indicators of increase in risk, but by understanding the number of lots and houses, indicators of risk can be developed. If B2 and B3 are significantly increasing it may indicate either inadequate planning controls in district plans, or that hazard zones are moving inland or so more properties are being affected.

**We recommend that the methodologies set out in the Pilot Report for measuring B2 and B3 should be further developed** and described based on those in the report, to enhance accuracy, and to ensure that when the baseline indicators are re-measured the same methodology can be applied, and so avoid counting errors.

There are methodological issues with separating out and separating reporting on the primary and secondary risk zones. This is because the Councils are using quite different methods of dividing the hazard zones into gradations of hazard. This is explored in the Pilot Report. In our view the Council should consider compiling and reporting on baseline indicators for the total hazard zone and not for the primary and secondary zones. The regional policy does not differentiate between primary and secondary hazard zones. This single “zone” method will have application to all territorial authorities with coastal boundaries in the Bay of Plenty. **We therefore recommend that data is collected for the hazard zone as a whole and not for “primary” and “secondary” zones.**

The setback indicator – B1 – is problematic as it potentially records changes in the coastline erosion and accretion processes as much as human activity to set back development further from the coast as it exists at any one time. In addition there are minor issues surrounding migrating streams at the coastline which can alter the setback – where to measure it – and whether changes in setback are the result of the migration of the stream – or human induced factors of setting building further back. **It is our recommendation that the Council review its state of the environment reporting of coastal processes rather than continue with the setback monitoring.** Reporting on the state of coastal processes can occur at the same time at risk indicator reporting and provide useful information as to whether the coastline in specific areas of concern (the areas where risk indicators are measured), are indicating accretion or erosion, and the short term and long term patterns emerging.

## 5 Trendline indicators

The initial study identified a range of trendline indicators as follows:

- T1 number of subdivision consents granted
- T2 number of land use consents for buildings in hazard areas
- T3 number of dwellings with various relocatability abilities
- T4 additional number of dwellings
- T5 additional number of lots
- T6 percentage of additional dwellings subject to resource consent conditions on relocatability, building setback and coastal erosion monitoring
- T7 additional physical area adjacent to the coast vested as reserve
- T8 average change (increase being desirable) of the setback distance of newly consented houses compared to overall average and average of buildings they are replacing.

The trendline indicators were developed both through the initial Hill Young Cooper report and also as a result of the Pilot Report study.

Some of the trendline indicators are another way of recording the baseline indicators, if the baseline indicators are measured again at some period in the future.

On the basis that eventually all subdivision consents are actioned, then T1 – number of subdivision consents - is a surrogate (and not a very accurate one) for new residential lots. Another way of gaining similar information is to measure B2 – total number of residential lots on a planned basis. B2 (2008) – B2 (2003) should be a more accurate measure of the change in total residential lots than using T1. On a similar the basis - T2 - land use consents – is largely concerned with additional houses. In the same way measuring B2 (2008) – B2 (2003) will give a more accurate measure of total houses in hazard zones than measuring land use consents.

T6 is a measure of the level and strength of resource consent control exercised on residential buildings in the hazard zones. T6 is the critical method by which total physical risk is managed, and as such should provide the most important information on whether “total physical risk” is increasing or not. T6 is also a surrogate measure of the fact that Councils have appropriate rules in their district plans which require resource consent for residential building and in this way relates to the foundation indicators.

The Pilot Report has not completed the work of gathering data for T6 due to poor or incomplete information from the district councils. However the presence of a resource

consent applying to a house or additions is a good indicator that total physical risk from coastal hazards is being managed. A greater percentage of houses in the hazard zones subject to resource consent conditions must be regarded as ensuring “no increase in total physical risk” in terms of existing regional policies. However we now have the view that different management regimes will be appropriate through resource consent conditions depending on the exact circumstances of each property and the development proposed. **As a result we recommend that T6 be modified to simply identify the number of houses that are subject to resource consent.** The more finely grained requirement that resource consents must include conditions on relocatability, building setback and coastal erosion monitoring be dropped as it represents a level of sophistication that causes problems in data gathering and may not be appropriate in every case.

**We recommend that the Council simplify the baseline and trendline indicators into a single set of risk indicators.** These are:

- Indicator 1: houses in the coastal hazard zones as indicated by the district plan or studies now completed for all district councils at specified 5 yearly dates
- Indicator 2: residential lots in the coastal hazard zones as indicated by the district plan or studies now completed for all district council at same specified 5 yearly dates and
- Indicator 3: number of houses subject to resource consent to manage coastal hazard risk at same specified 5 yearly dates.

All three indicators should be termed trendline indicators. The information should be collected by area of concern, and also totalled for the Bay of Plenty on a 5 yearly basis, with a date in 2003 used as the baseline year. At face value increases in number of houses, or increases in residential lots may indicate concern. However it is Indicator 3 which provides the real measure of risk management. If this is increasing at a faster rate than lots or houses, then total physical risk as defined by regional policies, should not be increasing, and the regional policy should be met.

We have already discussed the issues with respect to the lack of utility of the setback indicators and an alternative approach.

## 6 INDEX OF RISK – A SUGGESTION

The above indicators will enable the development of a simple risk index as follows: Take a start date – based on the Pilot Report this will be a specified date in 2003. At that time the report indicates the following for the Bay of Plenty:

- A = total number of houses in the hazard zones = 931

- B = total number of houses subject to resource consent conditions concerning management of coastal hazards (not accurately determined as consents counted rather than houses ) ~ 30

The risk index in 2003 could be measured as the starting point as the percentage of houses subject to resource consent. This index must increase over time to demonstrate that appropriate district plan controls are in place and are being implemented and that “total physical risk” is not increasing.

Risk index formula would be: ((A year #) divided by C year # ) X 100). This would be recalculated every 5 years.

An example as follows:

In 2003 there are 931 houses and 30 of this total have resource consent conditions so

$$(30/931) \times 100 = 3.22$$

Assume in 2008 the following: 950 total houses (but there have been a significant number of replacement houses so 50 resource consent applications) and 80 of this total number of houses now have resource consent conditions so

$$(80/950) \times 100 = 8.42$$

In this scenario the risk index is increasing in an appropriate way towards 100, but is still well short of an ideal situation. The risk index seeks to have the number approach 100 – representing 100% of all houses in the hazard zone being subject to resource consent. This can be demonstrated by the following formula:

Assume in 2050 there are 1000 houses in the hazard zone and 1000 are subject to resource consent as all houses have been replaced since the zero date of 2003. The formula will work as follows:

$$(1000/1000) \times 100 = 100$$

## 7 SUMMARY

The Pilot Report has been a useful exercise in exploring what we consider now, to be an overly complex set of indicators. In this review we have reached the view that much could be gained by greatly simplifying the indicators to:

- measure whether Councils have addressed regional policies with respect to the presence of hazard zones and rules on development in their district plans (the foundation indicators)

- measuring the total number of houses and residential lots at specified dates , and by comparing data at 5 yearly dates measuring change
- measuring the number of houses subject to resource consent at specified dates, and perhaps developing a risk index, and by comparing the data or index at 5 yearly dates measuring whether “total physical risk” is increasing.

The resource consent indicator requires the maintenance of the database by EBOP which should be updated on a continual basis. This database needs to be completed to date to provide a starting point for the assessment of risk indicator