November 26, 2018

Environmental Protection Authority
(by email)

Attn. The Decision-Making Committee for the CRL Application

Dear Committee Members

Re: Response to Request for Information (Dated 14 November 2018) under Section 54(1)

Osbornehay write on behalf of their client, Coastal Resources Ltd (CRL). This is in response to the questions posed in the EPA letter dated 14 November 2018. In responding to these questions, input has been sought from Mr Male, Mr West, Mr Connon and Mr Akehurst who will all be presenting evidence at the Hearing.

A number of points will be further addressed in the supplementary evidence for CRL.

1 *Please provide further information on the area within the Northern Disposal Area (NDA) that will be impacted by the additional volumes of dredged material (ie exclusive of the area in the NDA already impacted by existing dumping activity), and in the vicinity of the NDA (the continental shelf off-shore eastern Great Barrier Island). Specifically:*

- *The substrate*
- *The expected biota present in that environment*
- *The likely presence of any sensitive benthic marine habitats or coral species protected by Schedule 7A of the Wildlife Act*

A combination of seabed photographs (Flaim, 2011) and repeated seabed core samples from at least 22 sample sites in a 22 km^2 area (Flaim, 2011, Bioresearches, 2018) and Multibeam Echo sounder surveys (Flaim, 2011, Survey Works, 2017) covering the entire Northern Disposal Area have shown the seabed of the Northern Disposal Area to be flat featureless sandy silt.

The Map 6.1 in the Sea Change Hauraki Gulf Marine Spatial Plan 2017 shows rocky reef features located approximately 21 km north north west of the Northern Disposal Area and another area approximately 17 km south south east of the Northern Disposal Area. In addition, this map shows the seabed habitat to be moderately deep mud inshore of the Northern Disposal Area. The habitat map does not extend beyond the CMA boundary
.
As presented by Mr Duffy, Lee, *et al* (2015) mapped the benthic habitats to the north of the Northern Disposal Area using seafloor video surveys, from 119 locations in an area approximately 745 km^2. They found a large number of sites (53/119) had no visible sign of epifauna. Of those that did have epifauna, four biotopes were identified;

- shallow water, macro-algae, *Ecklonia* sp. and *Ulva* sp. on rocky substrata
- deeper water diverse epifauna of sponges and bryozoans on rocky substrata,
- brittle star *Amphiura* sp. and sea anemone *Edwardsia* sp. on muddy sand,
- hydroids on mud.

Of these four habitat types the hydroids on mud, best describes the Northern Disposal Area. Lee *et al*. found that where mud dominated the seabed, especially at deeper than 90m, there were no identifiable epifaunal assemblages, except for occasional hydroids. With the absence of rocky substrate within the Northern Disposal Area no diverse epifauna biotype is expected to be present within the Northern Disposal Area.

The National Marine Invertebrate Collection, NIWA, has been examined and once the data is confined by geographic reference to east of Great Barrier Island and restricted to depths

Postal Address: PO Box 16, Warkworth 0941
Email: david@osbornehay.co.nz

between 100 and 300m, only three species are included. A bryozoan *Conescharellina pala* found east or the Mercury Islands in 132m of water, a sea squirt *Aplidium orthium* found 32km east of the Northern Disposal Area in 263m of water and a foraminifera *Globocassidulina canalisuturata* found in 179m of water 13.5km northeast of the Northern Disposal Area.

The database likely includes a number of other species present in similar habitat to that present within the Northern Disposal Area, however the database does not include habitat type, other than depth, and their presence outside the Northern Disposal Area suggests they are not exclusively found within the Northern Disposal Area. This was also a consensus reached by the marine ecology experts conference that the likelihood of threatened species being present within the Northern Disposal Area but not outside was none to very low.

The Conservation status of New Zealand marine invertebrates, 2013 was examined. Only 11 species are listed as "Threatened". None of these are expected to be present with in the Northern Disposal Area;
Boccardiella magniovata, large-egged polychaete,
Idioibla idiotica, barnacle,
Pumilus antiquatus, dwarf white lamp shell,
Bathymodiolus tangaroa, giant seep mussel,
Smeagol climoi, gravel maggot,
Smeagol manneringi, gravel maggot,
Spio aequalis, giant spionid worm,
Calvetia osheai, tree bryozoan,
Spiritopora perplexa, bryozoan,
Chathamisis bayeri, bamboo coral,
Paragorgia alisonae, bubblegum coral.

The monitoring reports submitted to the EPA to date list all the species/taxa identified to date in the Northern Disposal Area and this is further addressed and summarised in Appendix Five of the Impact Assessment.

2. *How many days a year is it anticipated that the sea state will prevent dumping being able to occur?*

This appears to be the same as question 13 in the further information request date 1 October 2018. As per the response to that request, it is anticipated that dumping will be prevented for around 50 days of the year. That figure is based on the actual number of days when dumping was prevented over the last year, which are considered to be reasonably representative.

3. *Please explain the operational limits in terms of sea state and what any effects of dumping at (or near) the operational limits will have on the plume?*

As described in response to question 12 in the further information request dated 1 October 2018, the Master of each vessel must exercise discretion taking into account not only the sea state, but also the vessel capabilities and load characteristics. This means there is no single sea state condition that defines a consistent upper limit on when dumping may occur. In practice, the current fleet have self-enforced limits of:

Tug - 35 knots

Dumb Barge - 3m swell

Self-propelled barge - 2m swell.

A recent example is that on 14 November a self-propelled barge departed Whitianga for the NDA with a load as the forecast was for a 1.2 m swell. However, as the vessel encountered a swell approximately double that forecasted en route to the Northern Disposal Area, it turned back to safe shelter.

As discussed in the evidence of Connon Andrews the effects of waves have minimal impact on sediment dispersion. The dominant coastal process that affects sediment dispersion is

tidal currents. Self-enforced limits in terms of wave height will only determine if dredged material is disposed of or not.

4. *Please provide further detail on the effects arising from the additional volume of material to be dumped between 100,000m^3 and 250,000m^3 on an annual basis for the term of the consent sought.*

The effects of the additional volume over 100,000m^3 per year is not a simple formulactic response.

Based on first principles as more dredged material is dumped the mound will increase in size and thus affect a greater area. However as the mound grows in size, the rate of expansion will decrease.

Towards the edge of the mound area once the mound has reached a certain size the volumes dumped will have less of an effect on benthic biota. As the dredged material spreads out from the deposit point by the time it reaches the edge of the mound the thickness of sediment will be less than that which triggers a significant ecological effect. This is further complicated by the fact that different biota will have different responses to the same level of sediment deposition.

The rate of addition of sediment to the mound will also modify the response of biota as some can withstand infrequent small sediment deposition events but not more frequent small events.

Again, first principles suggest that an increased dump volume from 100,000m^3 to 250,000m^3 per year would not result in a variation of the peak suspended solids concentrations within the plumes generated from each disposal event, unless the barge size is varied.

Assuming a maximum barge size of 1,200m^3 only approximately 84 dump events would occur if the annual limit was 100,000m^3. Increasing the annual volume to 250,000m^3 would add a further 125 dump events. The result of increased annual volume is not increased intensity of effects but an increase in the frequency of effects. The effects of the plumes will remain within the mid to lower water column within the Northern Disposal Area and be of an intensity not likely to cause adverse effects due to the plumes' limited area and duration. The only biota likely to be affected by mid-water plumes are fish and mammals, which are mobile and able to avoid the plumes if they so desire. The effects will not be lethal. The limited duration of the plume events is not likely to permanently displace biota.

5. *Please provide information on how the 250,000m^3 demand was calculated. In particular, how the unspecified dredging and capital maintenance volume of 150,000m^3 was determined.*

CRL no longer relies on its initial assessment of the 150,000m^3 contingency. A more detailed analysis has been performed on the likely demand for dredging from existing and known source sites in the Auckland Region, and this has been combined with projected regional growth (and related demand for berthing), to re-assess what an appropriate annual volume would be.

A significant factor in this analysis is that existing source sites have been minimising dredging, seemingly due to lack of cost-effective disposal options, and it is expected that there will be a return to consented dredging volumes if the Northern Disposal Area dumping allowance is increased. The analysis concludes that demand for dumping capacity of 250,000m^3 will be exceeded in approximately 10 years.

6. *Please provide information on the average volume of shipping traffic in the general vicinity of the NDA (as well as the Colville Channel) and the anticipated routes the dumping barge is expected to take. Where available, please include the general sizes of any vessels.*

Overall, there are over 400,000 vessel (e.g. shipping, fishing, ferries, cruise, navy, private) movements through the Hauraki Gulf annually. This figure is from data compiled from a range of sources including Auckland Transport (2014) Ferry Development Plan; Maritime New Zealand (2016) Summary of Recreational Boating Research; Game Changers (2017) Recreational Boating Participation Research and the Ports of Auckland website (2018).

Figure One below is the MNZ supplied data showing AIS equipped vessels leaving the Hauraki Gulf. There is no similar data available for the NDA area or the Colville Channel. The two arms of traffic leaving the page on the right-hand side are leaving the Gulf to the north-east and it is likely these are predominantly travelling through the Colville Channel.

The route of the vessels travelling to and from the Northern Disposal Area will be dependant on the source of the dredged material to be disposed of. I have attached the routes from Hobsonville and Pine Harbour Marinas as an example.

Currently the bulk of trips to the Northern Disposal Area are undertaken by:

- Soundcems self-proposed barge (43m length with 2 x 270kw engines); and
- Christine Mary Tug (21m length with 2 x 375kw engines) towing the TR Healy barge (40m length).

Sincerely,

David Hay
Planning Consultant
Ph: *09 425-9844*
Mobile: *027 425-0234*

Copy to: CRL, Attn. Mr Simon Male (by email)

Attachments: Routes from Pine Harbour and Hobsonville Marinas

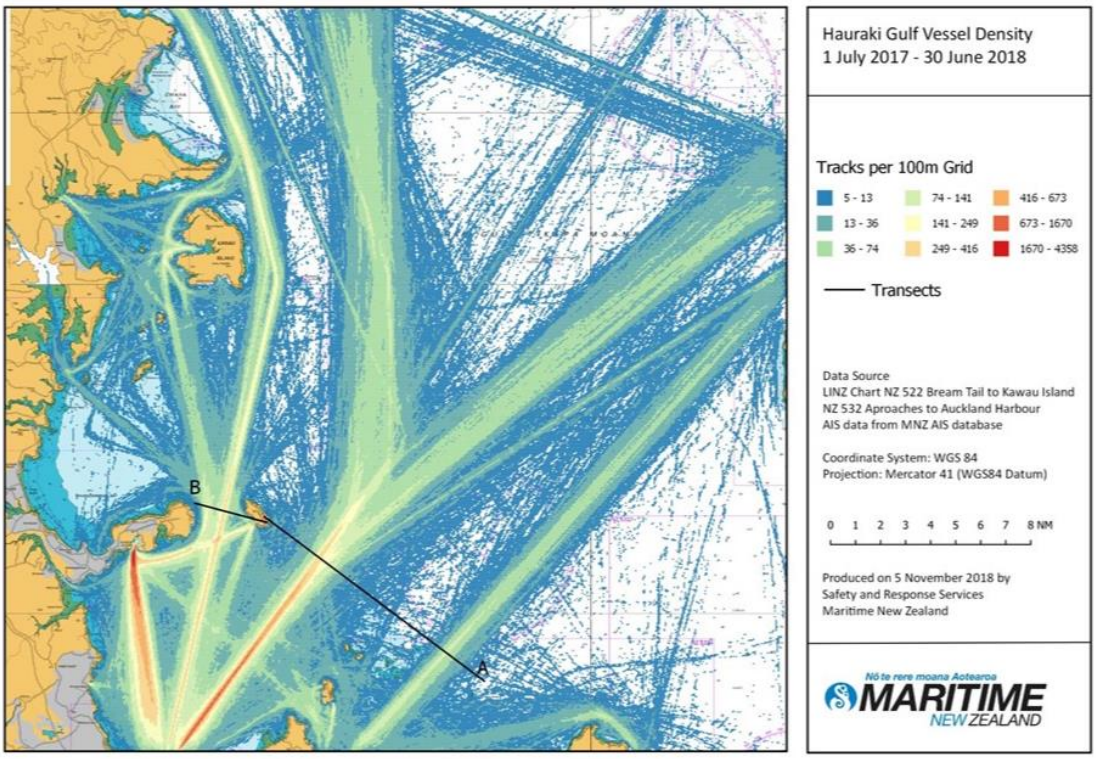
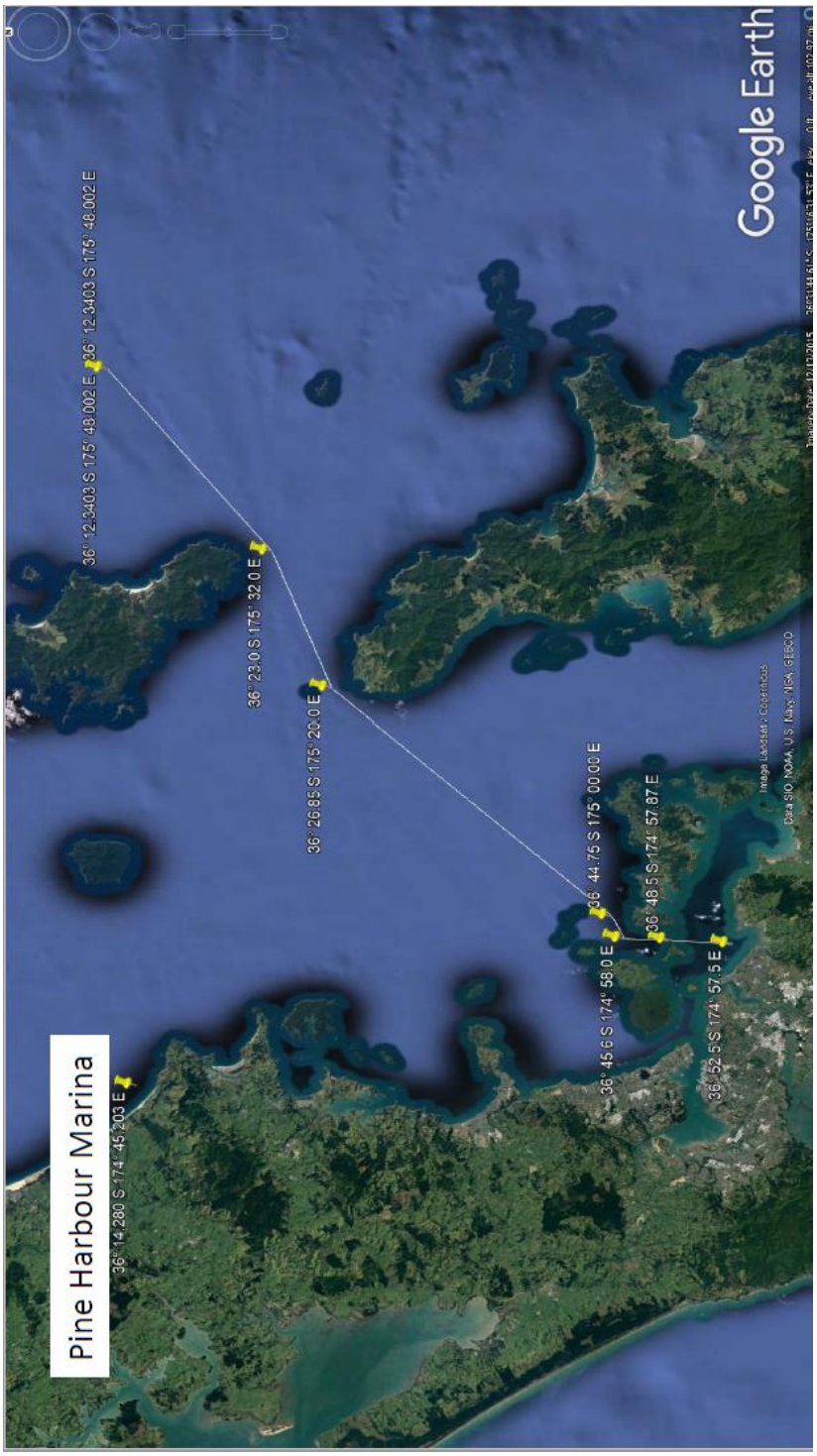
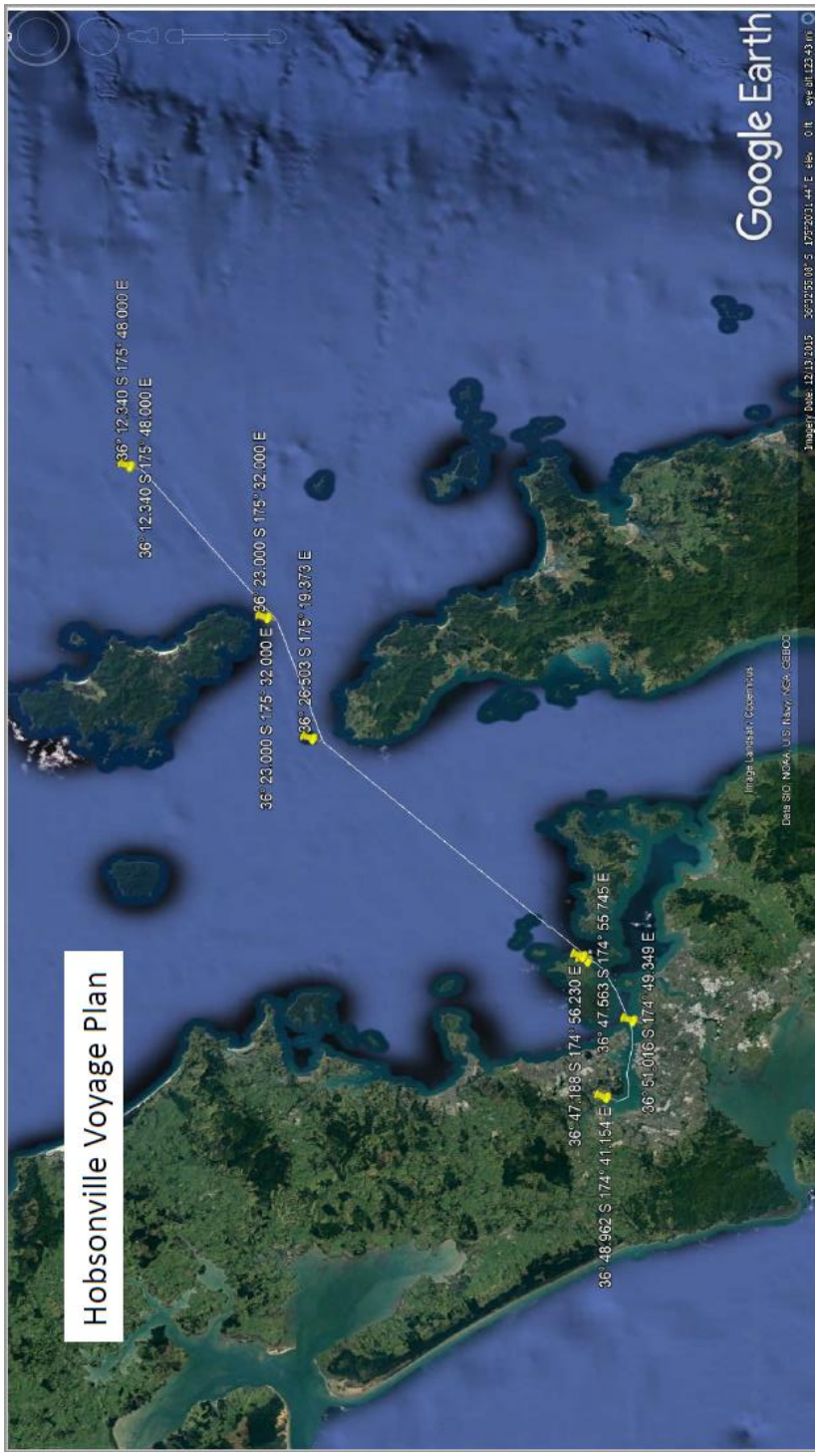


Figure One: AIS equipped vessel moments leaving the Hauraki Gulf YTD as at 30 June 2018.


Pine Harbour Marina
36° 14.280 S 174° 45.203 E
36° 45.6 S 174° 58.0 E
36° 44.75 S 175° 00.00 E
36° 48.5 S 174° 57.87 E
36° 52.5 S 174° 57.5 E
36° 26.85 S 175° 20.0 E
36° 23.0 S 175° 32.0 E
36° 12.3403 S 175° 48.002 E
36° 12.3403 S 175° 48.002 E
Google Earth


Hobsonville Voyage Plan
36° 12.340 S 175° 48.000 E
36° 12.340 S 175° 48.000 E
36° 23.000 S 175° 32.000 E
36° 23.000 S 175° 32.000 E
36° 26.503 S 175° 19.373 E
36° 48.962 S 174° 41.154 E
36° 47.188 S 174° 56.230 E
36° 47.563 S 174° 55.745 E
36° 51.016 S 174° 49.349 E
Google Earth