

Agriculture, Resources and Environment Committee  
Parliament House  
BRISBANE QLD 4000  
Email: [arec@parliament.qld.gov.au](mailto:arec@parliament.qld.gov.au)  
26.10.2013

**Re: Submission to the Inquiry into the North Stradbroke Island Protection and Sustainability and Another Act Amendment Bill (the Bill)**

Dear Committee

I am a permanent resident of North Stradbroke Island, a scientist, and I run a small business from the island.

**Summary of the Bill's outcome**

The Bill will allow for the extension of mining at Enterprise beyond 2019 to at least 2035 and will increase the area to be mined. The Bill will also allow for additional 5-year extension at Yarraman and Enterprise for the purposes of rehabilitation, bringing closure dates for the two mines to 2020 and 2040 respectively.

**Government reasons**

Economy

The government's policy driver for the amendment is to provide for a longer economic transition for the island economy.

Environment

With regard to environmental impacts:

*The government is making every effort to limit the environmental impacts of the proposal.*

Page 7 Explanatory Notes

*The government considers that the negative impacts of ceasing mining under the current framework by 2019 far outweigh the potential impacts from the extension of mining on NSI until 2035.* Page 7 Explanatory Notes.

Native title

The government position is that the Amendment *does not disadvantage the Quandamooka People. The legislative amendments will be done in accordance with the requirements of the Native Title Act 1993(Cwlth), including the payment of compensation for future acts, and will be done without requiring amendment to the current Indigenous Land Use Agreement (ILUA) between the State and the Quandamooka People. The State is committed to fulfilling its obligations under the ILUA.* Page 7 Explanatory Notes

**Comments**

I totally oppose the Bill. It should not be allowed to pass into legislation and I ask the Committee to make that recommendation.

**Economy**

I reject the argument that the island needs a further 20 years to transition the economy. Such a transition is on top of the eight-year extension to mining granted by the previous government for the purposes of transitioning. The premise that the economy needs 29 years to transition from the time of the 2011 NSI Act\* to 2040 is laughable. No independent economic report to substantiate the need for a 29-year transition has been provided for public scrutiny. The flimsy economic analysis prepared for the Agriculture, Resources and Environment Committee 21 October 2013 is inadequate.

The 29-year transition period is an excessive amount of time for an industry that provides only 13% of the jobs on the island (ABS 2011). The government has quite happily sacked 14,000 jobs from the public service but is prepared to extend mining a further 16 years to look after 100-odd jobs.

Mining jobs are decreasing, with the silica mine putting off workers this year because it's uneconomical, and Yarraman mine ending in 2015 because it is running out of minerals. As Yarraman accounts for about half the mine workforce, significant job losses are just around the corner.

There are no guarantees with mining jobs; they are subject to international market forces. The government is exposing the island economy to risk by placing so much emphasis on mining.

The revenue from mining cannot compensate for the damage to the islands, ecology, hydrology, geology and cultural heritage. Damage will also be done to the island's nature brand and associated business potential that rely on that brand being nurtured and protected.

The island's future depends on a sustainable, diverse economy based on Stradbroke's natural values, including businesses in tourism, education, arts and culture.

I participated in the previous government's engagement with the community to develop economic transition plans. The plans were full of practical and inspirational goals. The Newman government has buried those plans, not produced any alternative economic plans itself, and instead thrown all its efforts into finding a way to extend mining.

High value, low impact tourism was a goal that came out of the previous transition planning. The tourists that fall into this category are very discerning. An island with gaping mining pits and scars clearly visible on Google Earth are likely to put off such tourists.

Sand mining means environmental destruction and the inevitable "accidents" and miscalculations that result in further harm will keep the island in the spotlight for decades to come for all the wrong reasons. This will hold back the island's development in nature-based businesses.

It would appear the environment, the island's nature brand and indigenous rights and interests are being sacrificed for the primarily benefit of a mining company that is ultimately owned by a Belgium family.

Mining is the island's past, not its future.

## **Environment**

Following is a list of reasons why the Bill is detrimental to the island's environment. The Bill will:

> Extend mining at Enterprise beyond 2019 to at least 2035 and increase the area to be mined. This means increased irreparable damage to the environment.

> Allow mining into new areas surrounded by national park and internationally significant wetlands that support endangered and significant species. Mining will occur in close proximity to 18 Mile Swamp and the catchment to Blue Lake, a unique pristine water body dubbed God's Bathtub. Both wetlands contain endangered species. Mining will operate right within the aquifers feeding these internationally listed wetlands. Permitted mining runs along Ramsar boundary to the east, with no buffer, and even crosses into Ramsar in one area (Herring Valley). This should trigger assessment under the EPBC Act provisions. (Refer to attached Map NSI Bill 2013 vs NSI Act 2011 Enterprise Mining Restrictions + Ramsar). It appears mining incursion into Ramsar has occurred in the past at the Ibis mine, which immediately preceded mining at Enterprise. Was this approved? If not it raises concerns about attitudes to Ramsar on the island. I have attached aerial photos that show part of Ibis mine area before mining and after mining (Map Ibis Mine incursion into Ramsar).

> Pose unacceptable risks to Blue Lake.

Scientific studies into Blue Lake show it to be a unique lake that has remained stable for over 7,000 years. <http://newswatch.nationalgeographic.com/2013/06/14/australian-lake-untouched-by-climate-change-called-gods-bathtub-and-home-to-tiny-perch/>

During those 7,000 years, the level of the lake has not fluctuated, even though the island has been through severe dry times during that period. The reason is that Blue Lake sits within the island's aquifer. When there is no rainfall, water still constantly flows into the lake from the aquifer and into the outflow stream to 18 Mile Swamp. From how far away does water drain to feed Blue Lake in a dry period? No one can say. This raises serious concerns about permitting mining activity anywhere near Blue Lake. (Refer to Map 2013 Bill- mining area allowed near Blue Lake)

Plans to pump drinking water to the Redlands were shelved because the risks of interfering with the aquifer feeding Blue Lake were too great. Yet the Bill allows for mining to occur in closer proximity to Blue Lake than the bore field would have been. I serve on the community reference panel that deliberates on the water plan for the island.

> Allow for the destruction of areas earmarked for future national park. The NSI Act 2011 provided for a process to declare 80% of the island national park by 2026 jointly managed with the Quandamooka People. The areas now destined to be mined should be in national park because of their biological, scenic and cultural values. Rehabilitation does not restore the country to its original condition and therefore will compromise or negate its value for future national park. (Refer to attached Map NSI Bill 2013 vs NSI Act 2011 Enterprise Mining Restrictions + National Park)

> Allow for the destruction of Mt Corrie, a particularly scenic high point with 360 degree views across bush to the Pacific on the east and Moreton Bay to the west. (marked on attached maps)

> Fragment future national park and further delay the hand-back of the land to the native titleholders.

> Ensure the horrendous scars from mining will be visible from key scenic lookouts for years to come, including from Mt Vane and Neembeeba lookout.

> Allow for mining in environmentally sensitive areas listed under Remnant Biodiversity Status as *Of concern dominant* and *Of concern subdominant* regional ecosystems, namely

R.E.s 12.2.10, 12.2.7, 12.2.1 and 12.2.5. This was not permitted under the current NSI Act 2011 (Restricted mine path map NSI 2 and clause 19, NSI Act 2011, and map attached to this submission- Remnant Veg Biodiversity Status).

>Allow mining to continue to destroy the internal structure of dunes created over millennia. It's the layering and indurations within dunes that guides water flow to the habitats that depend on it. As the Quandmooka People say, water is the lifeblood of the island.

>Allow mining into the regional aquifer which is an important source of drinking water.

>Potentially allow for destruction of pockets of koala habitat. It's time consuming and difficult to find koalas in remote areas of the island. It's known from past records that pockets of koalas did occur on the east coast of the island including in the Enterprise area. These pockets are likely to depend on subterranean springs and perching layers easily damaged by mining and not possible to restore. A koala was heard during the surveys done for the Enterprise Environmental Studies Report (ESR 2004) and other reports of koalas in the area surface from time to time. A comprehensive koala survey is needed in the Enterprise area.

>Allow for mining in known areas of acid sulphate soils (Herring Valley)

>Allow for mining in areas zoned "Conservation" under Redland City Council

> Allow for weakened environmental controls

Sibelco's current Environmental Authority MIN10097150 (Current EA) is replaced with Environmental Authority EPML00575913 (New EA) that will, if the Bill passes into legislation, become part the NSI Act. My understanding is that under the rule of statutory interpretation, if there is inconsistency in state laws, the later Act will prevail over the earlier Act to the extent of any inconsistencies. Therefore a number of prescribed conditions which have been removed from the Current EA will no longer apply. Other legislation cannot be relied upon. This is very concerning and I urge the Committee to examine this carefully. The bottom line is that environmental controls of mining on North Stradbroke Island will be significantly weakened if the Bill goes ahead. The full extent of this lowering of environmental conditions and ramifications need to be investigated thoroughly. This is a RED ALERT for the Committee.

To give some examples, I am most concerned that the following conditions have been removed and are either absent, inadequately replicated in the New EA or insufficiently robust.

Requirement for Baseline Environmental Studies and Environmental Studies Report removed. The Enterprise mine will now be allowed into an area (marked C on map in Bill, refer to attached maps) that has not had an environmental assessment; the Current EA does not cover it. Therefore a proper Environmental Assessment should be done, but the New EA no longer contains Section A10-A13. Instead these conditions have been replaced by an inadequate list of conditions (G5 in the new EA). No longer will baseline studies, or an Environmental Studies Report based on Terms of Reference developed with stakeholder input, be required.

Condition A5 A6 of current EA have been removed in New EA.

These two clauses require no environmental harm be caused beyond the boundary of the proposed mining tenements or beyond the areas nominated for mining within the lease boundaries. The replacement condition G1 lowers the bar on preventing harm. The current condition, A5, is stronger than G1 where tests in the Act have to be met before any action can be taken, s16, s17 Environmental Protection Act 1994 (relevant section of Act copied be-

low).

Also of concern is that this weakening of protection will compound when combined with the effect of other missing conditions in the New EA.

Clause (A7) that prevented mining in a Category A or B sensitive area has been removed except for Yarraman mining lease ML1109. Therefore Category A & B sensitive areas are not protected at Enterprise Mine (MLs 1117, 1105, 1120) or on any of the non-winning leases. Even when rehabilitation is being conducted, there is the potential to damage Category A & B areas, so the condition should still stand for all winning and non-winning leases on the island but this has been removed for all but ML1109. Category A & B sensitive areas include Ramsar and endangered regional ecosystems. The endangered heathland community of R.E. 12.2.13 is associated with RE 12.2.10 and may occur in the new area to be mined at Enterprise if a closer examination is made. Category A and B areas also include cultural sites (Refer to Footnote Category A & B sensitive areas)

Some of the conditions relating to weeds H22, H23 (c), and H 24 have been removed. It's doubtful whether the reliance on legislation outside the EA will be as strong a protection as having the clause in the EA particularly for reasons outlined above in the introduction to this section.

Conditions A31-A37 of current EA have been removed. These conditions required the mining company to conduct investigations into a number of perched lakes that had been impacted by past mining operations, and to submit a report for assessment and decision on further action. This process has not been completed. The report was due in December 2008, was delayed until October 2010, and stakeholders have been waiting to examine the government's written assessment of the mining company's report. There were actions to be completed.

Parts of the national park have no buffer between park boundary and the allowed mining area (Refer to attached Map NSI Bill 2013 vs NSI Act 2011 Enterprise Mining Restrictions + National Park)

Mining is permitted along the magnificent escarpment of 18 Mile Swamp – the ancient coastline of Stradbroke and location of Aboriginal middens.

#### Further comments relating to the environment

A new Environmental Impact Study should be conducted for the whole area to be mined permitted under the Bill, given the substantially increased time-line provided by the Bill, and that areas not assessed within the Enterprise Mine Environmental Studies Report 2004 (ESR 2004) are to be included, and to allow for climate change impacts to be assessed.

The 2004 ESR only covered the period 2004-2012, Stage 1. *Detailed evaluation of the second half of the Enterprise Mine (i.e. 2013 onwards or Stage 2) is subject to further mine optimisation, feasibility and environmental studies* (Ref page 1-1 ESR 2004 Vol 1)

The 60-year legacy of past mining activities are scattered across the island directly impacting on 30% of the island. The ripple effect extends beyond this. The additional mining planned will enter the last intact stretch of high dune country (Refer to Map Previous mining disturbance and current mines)

Claims are made that some of the areas to be mined have been mined before, however they were shallow dry mines, not the deep mining that occurs today.

Past mining scars are visible from outer space even after 30 years post rehabilitation (Map North Stradbroke Island from Space)

No matter how good rehabilitation is there is no science to say it can be returned to original and it's likely to be at risk from invasive weeds, feral animals and extreme weather events. I attach an opinion piece written by Professor Carla Catteral, one of Australia's leading ecologists who outlines the risks to the island's ecology after mining.

### **Native title**

This appalling legislation rides roughshod over the rights and interests of the native titleholders, the Quandamooka People, and their native title agreement with the State.

It is my understanding that the position held by Quandamooka Yoolooburrabee Aboriginal Corporation (QYAC) is that:

The amendment of the NSI Act in the manner proposed will effect a breach of the Court orders in *Delaney v State of Queensland* and the ILUA, and the Quandamooka People reserve their right to seek specific performance, injunctive relief and/or costs.

The Bill is inconsistent with the ILUA, and the Quandamooka People reserve their right to seek declaratory relief in reliance on s109 of the Constitution and costs.

I am deeply concerned by the government's treatment of the Quandamooka People. I attended the consent determination on July 4, 2011 and was overwhelmed by the optimism and pride that day brought.

Native Title was to herald a new future for the island.

Instead the Newman government slammed on the brakes in order to pursue its mining agenda.

The government cannot and does not have a 'mandate' to ride roughshod over native title agreements. Nor does it have a mandate to bring about damage to Stradbroke's iconic environment on which its future depends.

### **Sovereign risk**

A justification given for further extension of mining is to remedy the sovereign risk issue for the State of Queensland for cutting short mining leases. The assertion doesn't apply because in 2011 most of the key Enterprise leases had expired and there was no automatic right to renewal. Had the provisions of the Mineral Resources Act been applied it's very unlikely the leases would have been renewed. The previous government legislated a very generous extension of eight years for Enterprise mine to continue and allow for an economic transition period.

The Quandamooka People have been basing their business decisions on an end date of 2019 for heavy mineral mining on the island. It could be argued that prolonged mining is creating investment risk for the alternative businesses built around the island's natural values and culture.

### **Mining company PR and influence with government.**

I am very concerned that the millions of dollars the mining company has spent on PR, including cinema and newspaper advertisements, stickers, signs, flyers, brochures, focus groups, rallies and the \$90,000 election campaign in Ashgrove to get Mr. Newman elected, has bought influence with government.

Sibelco has been receiving special treatment from the Queensland Government over the rights and interests of the Quandamooka People, as revealed in the ABC 7.30 program (18.7.13) and in Estimates questions to Mr. Cripps, Minister for Natural Resources and Mines (19.7.13).

Meanwhile, the community has been manipulated and bombarded with spin and fear-mongering for years. It seems the government also absorbs this without properly investigating the facts. Even at the public briefing, the government repeated mining company spiel that electricity prices will rise if mining ceases. The truth is electricity prices are governed by legislation, and everyone is on the same tariff.

It is inappropriate for Sibelco to be further rewarded with mine extensions when it is still before the courts facing charges for the removal and sale of sand from the island without the correct permits and whilst question marks hang over the lack of approval for Enterprise Mine under the provisions of the EPBC Act.

## **Consultation**

The only stakeholder to be consulted on the legislation was Sibelco. All other stakeholders including the Quandamooka People have been excluded. This is shameful.

The public has only been given a little over a week to comment on complex legislation that has many ramifications for the island community, the environment, the Quandamooka People and the People of Queensland. This is a woefully inadequate time-frame as is the time for the Committee to deliver its report by 14 November 2013.

I have not been able to cover all aspects of the Bill that I may have concerns about. If I have not touched on a particular aspect, it should not be taken as accepted.

I am happy and willing to provide further information or clarification to the committee if they require it for their deliberations. I would welcome the opportunity to speak at the public inquiry.

I thank the Committee for the opportunity to make a submission.

*JM Aldenhoven*

Dr Jan Aldenhoven

Point Lookout QLD 4183

## Footnotes

\*2011 NSI Act: *North Stradbroke Island Protection and Sustainability Act 2011*

#Endangered and Significant Species

EPBC listed species in 18MS Reference Environmental Studies Report for Enterprise Mine (ESR 2004) unless otherwise stated:

**Swamp orchid** *Phaius australis* (Endangered EPBC Act, Endangered NCA 1992)

**Golden Swamp orchid** *Phaius bernaysii* ( Endangered EPBC Act, Endangered NCA 1992, restricted to North Stradbroke Island and possibly Moreton Island). Alison Specht (*pers.comm.*) May be in the area but not confirmed.

Oxleyan **Pygmy Perch** *Nannoperca oxleyana*.(Endangered, EPBC Act, Vulnerable NCA 1992)

**Wallum Sedge Frog** *Litoria olongburensis* (Vulnerable EPBC Act, Vulnerable NCA 1992) (see below for more detailed list of species in 18 Mile Swamp)

EPBC listed species recorded in terrestrial areas adjacent to 18MS (reference Environmental Studies Report for Enterprise Mine 2004:

**Koala** (Vulnerable EPBC Act, Vulnerable NCA 1992),

**Golden tipped Bat**, *Kerivoula papuensis* (Vulnerable EPBC Act, Near Threatened NCA 1992)

Some of the western wetlands also contain the EPBC listed Oxleyan **Pygmy Perch** *Nannoperca oxleyana*.(Endangered, EPBC Act, Vulnerable NCA 1992)

**Wallum Sedge Frog** *Litoria olongburensis* (Vulnerable EPBC Act, Vulnerable NCA 1992)

Significant Plants (Refer to Vol 3 pp 45, 47)

*Acacia baueri* (Rare, NCA 1992)

*Durringtonia paludosa* Durringtonia (Near Threatened NCA 1992)

*Phaius australis* lesser swamp orchid (Endangered NCA 1992, Endangered EPBC Act)

*Thelypteris confluens* Swamp Fern (Vulnerable NCA 1992)

*Todea barbara* King Fern

(All the above plants considered Significant on NSI by the Australian Heritage Commission)

*Phaius bernaysii* yellow swamp orchid ( Endangered EPBC Act, Endangered NCA 1992, restricted to Stradbroke and possibly Moreton Island). Alison Specht (*pers.comm.*). May occur in the 18 Mile Swamp area, but not yet confirmed.

Frogs (refer to Table 3-22, pp 3-34 Vol 1)

*Litoria cooloolensis* (Near Threatened NCA 1992)

*Crinia tinnula* (Vulnerable NCA 1992)

*Litoria freycenti* Vulnerable NCA 1992)

*Litoria olongburensis* (Vulnerable NCA 1992, Vulnerable EPBC Act)

Fish (refer to p 3-41, Vol 1)



*Nannoperca oxleyana* Oxleyan Pygmy Perch. (Endangered, EPBC Act, Vulnerable NCA 1992)

*Radinocentrus ornatus* Ornate Sunfish ( designated potentially threatened by the DPI)\*

*Ambussi agassizii* Olive Perchlet (listed as Rare by Action Plan for Australian Freshwater Fishes (Wager and Jackson, 1993))

*Mogurnda adspersa* Purple spotted Gudgeon (listed as Rare by Action Plan for Australian Freshwater Fishes (Wager and Jackson, 1993 and Restricted by Australian Society for Fish Biology))

\**Rhadinocentrus ornatus* (Ornate Sunfish or Rainbowfish; the population is in decline and its considered to be regionally-significant priority taxa in SE QLD,

significant for South East Queensland Bioregion under the Biodiversity Assessment and Mapping Methodology (Environmental Protection Agency 2002), see [http://www.brisbane.qld.gov.au/2010%20Library/2009%20PDF%20and%20Docs/4.Environment%20and%20Waste/4.7%20Wildlife/environment and waste sunfish CAS 2010 d4.pdf](http://www.brisbane.qld.gov.au/2010%20Library/2009%20PDF%20and%20Docs/4.Environment%20and%20Waste/4.7%20Wildlife/environment%20and%20waste%20sunfish%20CAS%202010%20d4.pdf)

#### Significant species found in Blue Lake

*Nannoperca oxleyana* Oxleyan Pygmy Perch.(Endangered, EPBC Act, Vulnerable NCA 1992)

*Eleocharius difformis* Spike rush (Endangered NCA 1992) Found only on North Stradbroke Island

*Litoria cooloolensis* (Near Threatened NCA 1992)

*Crinia tinnula* (Vulnerable NCA 1992)

Glossy Black Cockatoo (Vulnerable NCA 1992)

Information relating to Environmental Harm relevant to conditions A5, A6 (current EA), G1 (new EA)

### **Environment Protection Act 1994**

#### **16 Material environmental harm**

(1) Material environmental harm is environmental harm (other than environmental nuisance)—

(a) that is not trivial or negligible in nature, extent or context; or

(b) that causes actual or potential loss or damage to property of an amount of, or amounts totaling, more than the threshold amount but less than the maximum amount; or

(c) that results in costs of more than the threshold amount but less than the maximum amount being incurred in taking appropriate action to—

(i) prevent or minimise the harm; and

(ii) rehabilitate or restore the environment to its condition before the harm.

(2) In this section—

maximum amount means the threshold amount for serious environmental harm.

threshold amount means \$5000 or, if a greater amount is prescribed by regulation, the greater amount.

17 (1) Serious environmental harm is environmental harm (other than environmental nuisance)—

- (a) that is irreversible, of a high impact or widespread; or
  - (b) caused to an area of high conservation value or special significance; or
  - (c) that causes actual or potential loss or damage to property of an amount of, or amounts totaling, more than the threshold amount; or
  - (d) that results in costs of more than the threshold amount being incurred in taking appropriate action to—
    - (i) prevent or minimise the harm; and
    - (ii) rehabilitate or restore the environment to its condition before the harm.
- (2) In this section—  
threshold amount means \$50000 or, if a greater amount is prescribed by regulation, the greater amount.

Meaning of category A and B environmentally sensitive area according to Environmental Protection Act 1994, Environmental Protection Regulation 2008

Relevant to removal of condition A7 of current EA. Clauses that apply or could apply to NSI in relation to mining include those highlighted in red

Category A environmentally sensitive area means any of the following—

- (a) any of the following under the Nature Conservation Act 1992—
  - (i) a national park (scientific);
  - (ii) a national park;
  - (iii) a national park (Aboriginal land);
  - (iv) a national park (Torres Strait Islander land);
  - (v) a national park (Cape York Peninsula Aboriginal land);
  - (vi) a national park (recovery);
  - (vii) a conservation park;
  - (viii) a forest reserve;
- (b) the wet tropics area under the Wet Tropics World Heritage Protection and Management Act 1993;
- (c) the Great Barrier Reef Region under the Great Barrier Reef Marine Park Act 1975 (Cwlth);
- (d) a marine park under the Marine Parks Act 2004, other than a part of the park that is a general use zone under that Act.

2 Meaning of category B environmentally sensitive area  
A category B environmentally sensitive area means any of the following—

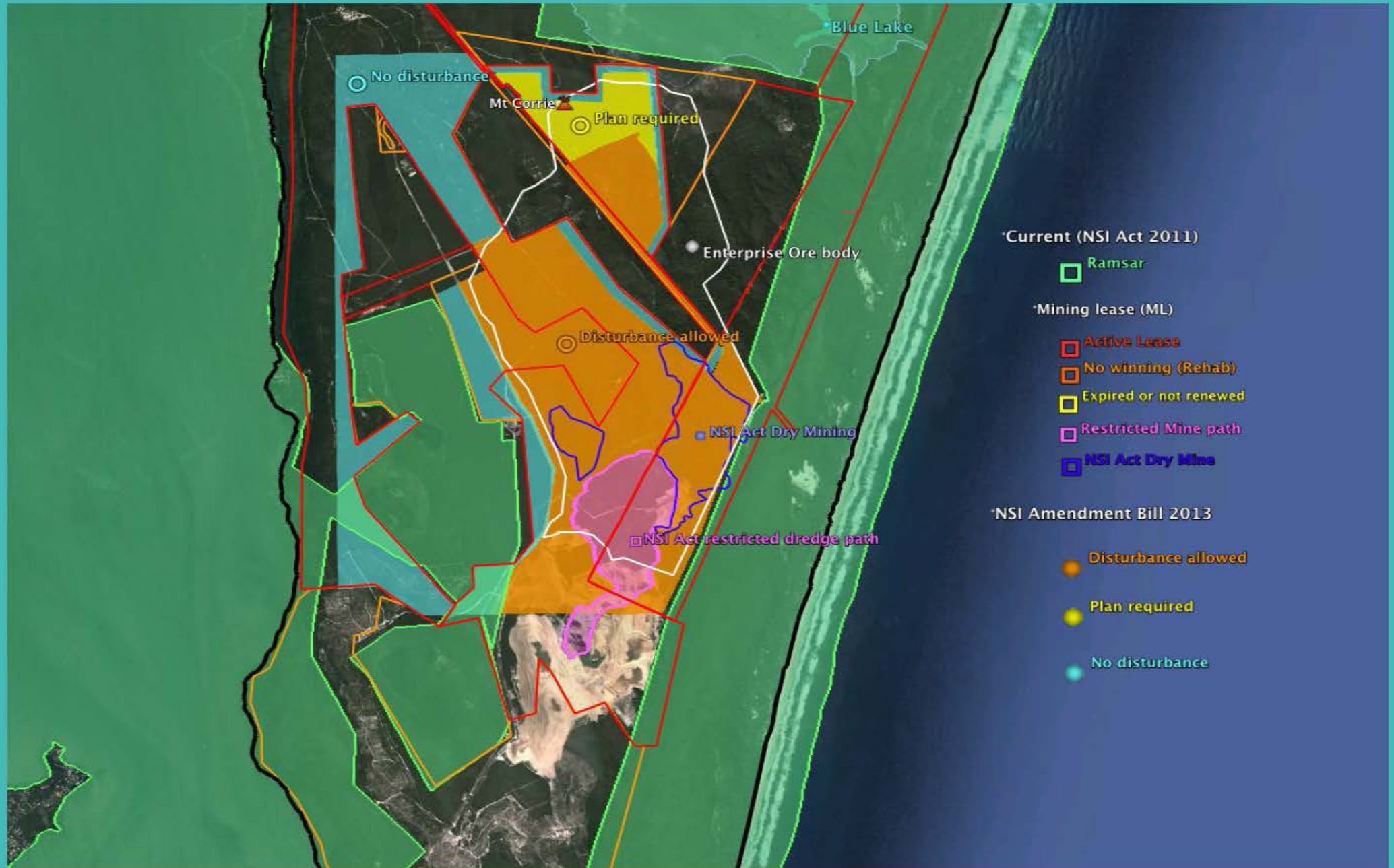
- (a) any of the following areas under the Nature Conservation Act 1992—
  - (i) a coordinated conservation area;
  - (ii) a wilderness area;
  - (iii) a World Heritage management area;
  - (iv) an international agreement area;
  - (v) an area of critical habitat or major interest identified under a conservation plan;

- (vi) an area subject to an interim conservation order;
- (b) an area subject to the following conventions to which Australia is a signatory—
  - (i) the 'Convention on the Conservation of Migratory Species of Wild Animals' (Bonn, 23 June 1979);
  - (ii) the 'Convention on Wetlands of International Importance, especially as Waterfowl Habitat' (Ramsar, Iran, 2 February 1971);
  - (iii) the 'Convention Concerning the Protection of the World Cultural and Natural Heritage' (Paris, 23 November 1972);
- (c) a zone of a marine park under the Marine Parks Act 2004;
- (d) an area to the seaward side of the highest astronomical tide;
- (e) the following under the Queensland Heritage Act 1992—
  - (i) a place of cultural heritage significance;
  - (ii) a registered place;
  - (f) an area recorded in the Aboriginal Cultural Heritage Register established under the Aboriginal Cultural Heritage Act 2003, section 46, other than the area known as the 'Stanbroke Pastoral Development Holding', leased under the Land Act 1994 by lease number PH 13/5398;
  - (g) a feature protection area, State forest park or scientific area under the Forestry Act 1959;
  - (h) a declared fish habitat area under the Fisheries Act 1994;
  - (i) a place in which a marine plant under the Fisheries Act 1994 is situated;
  - (j) an endangered regional ecosystem identified in the database known as the 'Regional ecosystem description database' kept by the department.

Relevant legislation is as follows:

<https://www.legislation.qld.gov.au/LEGISLTN/CURRENT/E/EnvProtR08.pdf>

# Map 1 : NSI Bill 2013 v NSI Act 2011 - Enterprise Mining Restrictions + Ramsar



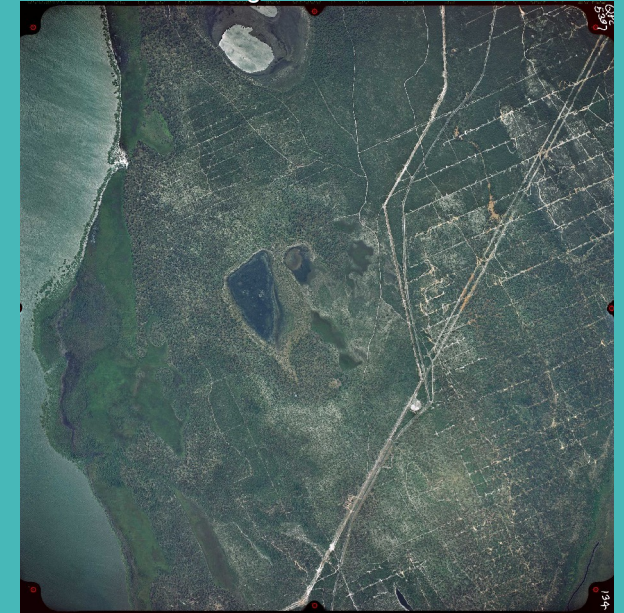
Map prepared by G Carruthers 28 October 2013

### Map 2 : Ibis Mine incursion into Ramsar

Pre-mining 1993



Pre-mining drill-lines 1994

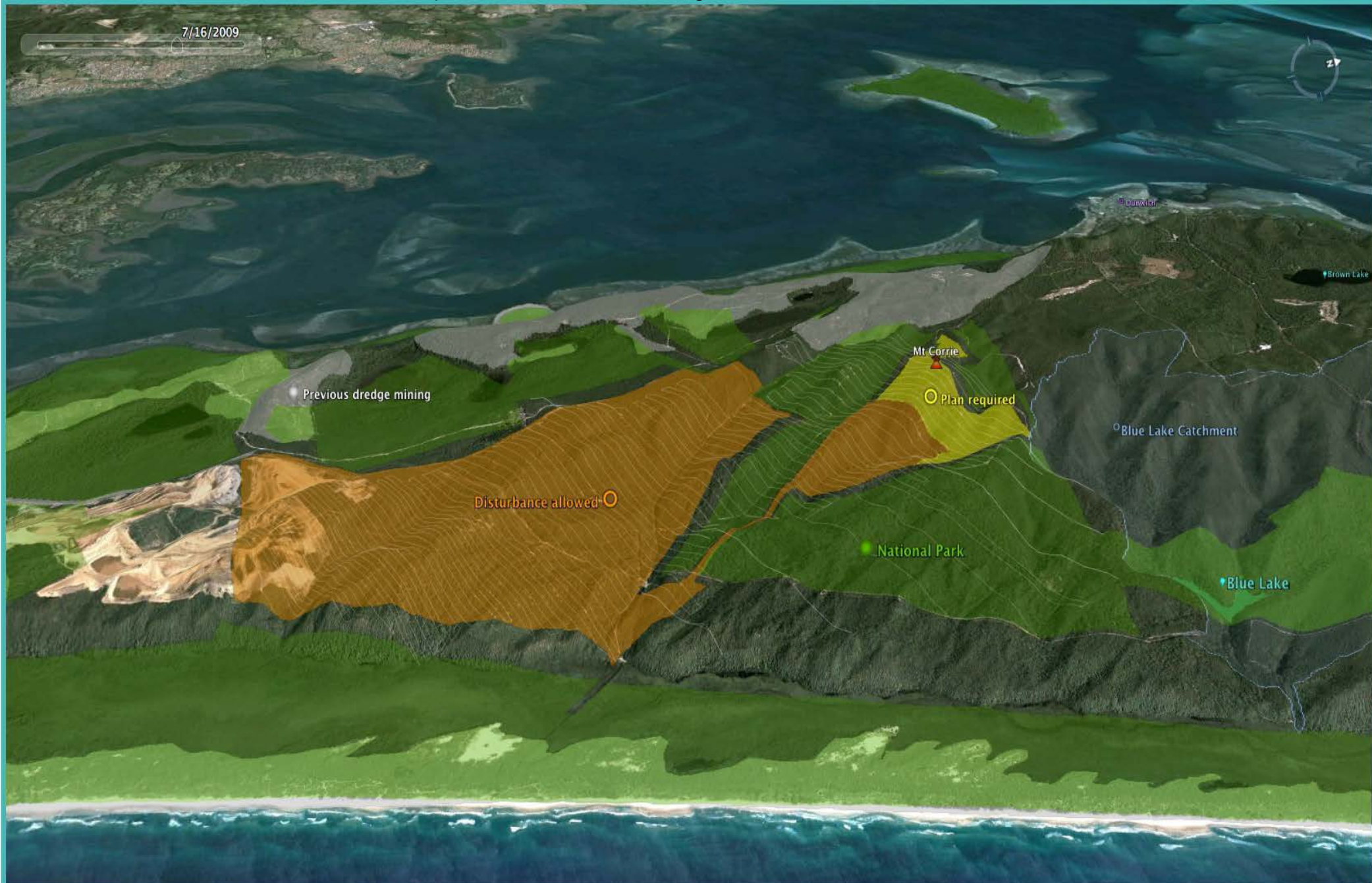


Ibis Mine startup 1997

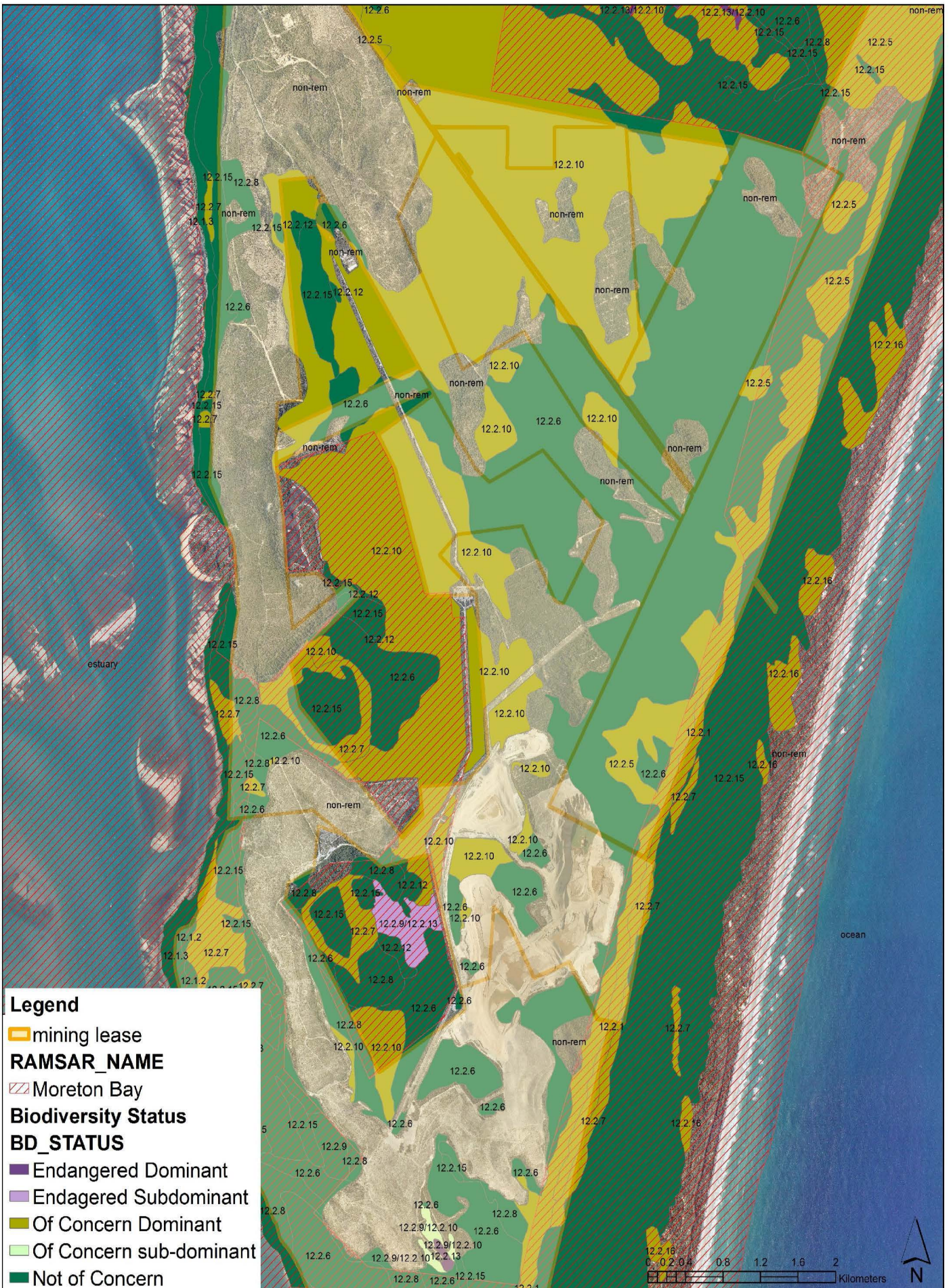


Post mine landform 2002











Vance Silica Mine

Yarraman Mine

Enterprise Mine

Previous mine clearing  
Current mine sites

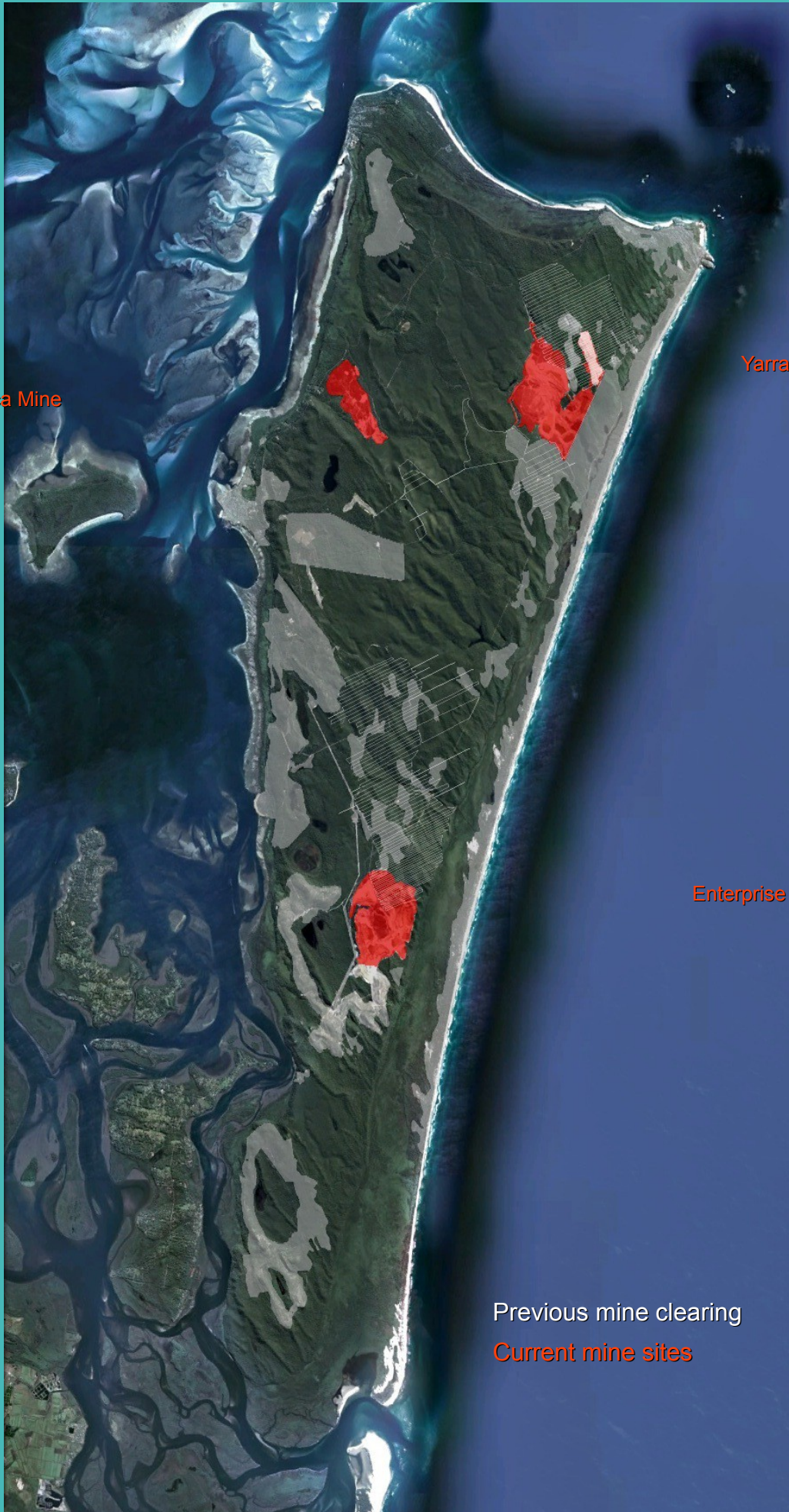




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27 May 2010

Dr Jan Aldenhoven  
SIMO, PO Box 255, Point Lookout,  
QLD, 4183 Australia

Re: Ecological success of post-mining rehabilitation, with comment on North Stradbroke Is.

Dear Dr Aldenhoven

Please find below a statement of my professional opinion relating to the above issue. I base this opinion on around 35 years' experience as a university-based ecological scientist, 25 of these spent working in the field of biodiversity and conservation in Queensland, and the past ten years as a leader of commonwealth-funded research programs and projects in ecosystem restoration.

The field of ecosystem restoration is currently in its infancy, something like the state of medical practice in the eighteenth century – attempts are being made which vary in their success but whose outcomes have not been subject to the kind of scientific scrutiny that is needed in order to be even moderately confident of a successful outcome. Furthermore, even in the most promising of situations, there is an extremely high risk that restoration will fail to produce the hoped-for outcomes within the expected time frame (ie, within a decade or two). Over longer periods, we simply don't know as the work has not been done.

For example early revegetation of sand-mined areas in eastern Australia involved the widespread planting of Bitou Bush, which then became a significant weed species invading natural areas along much of the east coast. Thankfully, post-mining practices have improved during the past three decades (for example, they focus on establishing locally-native rather than introduced plant species), but they would still fall a long way short of being able to replace the ecosystems that were present before mining.

Restoring an ecosystem requires the reinstatement of the full complement of pre-impact biodiversity. This encompasses both species diversity (including species of plants, worms, insects, birds, mammals, etc.) and the ecological processes which enable these species to persist in the longer term while maintaining resilience to natural disturbances (such as fire, storms and climate variation). Such processes include dispersal, nutrient cycling, pollination, food-chain maintenance and many others.

A scientific review of past attempts at restoring biodiversity and ecosystems (Hilderbrand *et al.* 2005) concluded that there is a very high risk that restoration projects will fail to achieve their objectives. Common reasons for this include the following.

1. The "field of dreams" fallacy. For example, it is incorrect to assume that initial success in growing a limited number of plant species will eventually result in colonisation of the area by most of the other desired species (the plants, animals and microbes of the original ecosystem). Many species lack the movement and dispersal capabilities to move to these areas in sufficient numbers for restoration of their populations.

2. The "carbon copy" myth. For example, it is not possible to copy an original ecosystem in situations where the physical properties of an area have changed (e.g., where soil nutrients or hydrological processes have been altered, as is the case in sand mining).
3. The "fast forward" myth. For example, natural forest ecosystems take centuries to redevelop after large-scale disturbance, and there is no proof that restoration actions will be able to significantly accelerate this.

My own recent research into the use of replanted rainforest sites by birds, reptiles and insects has shown that, while ecological development looks encouraging in the first decade (with apparently around 50% recovery after 10 years), there is a substantial risk that many sites may never regain the other 50% of biodiversity, and at best it will require many further decades (e.g., see Catterall *et al.* 2008).

In the case of post-mining restoration of natural ecosystems to sand deposits of coastal south-east Queensland, the failure risk is far higher, due to the unusual soil nutrient requirements of many plant species and the relatively poor ecological understanding of the fauna and flora. If the restored ecosystem only partially resembles the original, there is a further risk that it may lack resilience to fire, storms and climate change.

In mainland regions, where large areas of land are currently degraded as a result of previous land uses, there are various useful attempts currently under way at restoration, and these are likely to produce a net ecological benefit in spite of their uncertainty of full success. However in areas which currently support important natural or near-natural vegetation, the most likely outcome from removing the vegetation and soil structure, and then attempting to restore them, is a large net loss of ecological value, because this restoration will fall short of the previous natural community.

With respect to North Stradbroke Island in particular, there is currently a spatial mix of substantial areas of intact native habitat with other areas that were previously sand-mined and partially restored. This mix retains the potential to sustain the island's biodiversity in the longer term: the large intact areas can provide a source of species to progressively recolonise the partly-restored areas. However, if the total area of intact vegetation is reduced, together with further mining of other areas, there is a considerably greater risk that the island's ecological values will be irreversibly degraded over time.

Yours Sincerely



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