

The World Heritage Listed Great Barrier Reef, Port Development and Dredging: *Finding an Ecologically Sustainable Solution?*

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Introduction

Abbot Point, located 25 kilometres north of Bowen in north Queensland, is the most northerly Deepwater coal port in Australia. A scheme that will allow expansion of the Abbot Point coal port to become the world's largest coal port has ignited social unrest into conflict.

The major source of the conflict is the decision, on 10 December 2013, by the Federal Government's Environment Minister, Greg Hunt, to approve dredging and disposal activities in the World Heritage Listed Great Barrier Reef Area ("GBRWH Area"). These activities form part of the plan to expand the Abbot Point coal terminal. Approval was given for three million cubic metres of dredge spoil to be dumped in the Great Barrier Reef Marine Park, off Abbot Point. The Great Barrier Reef Marine Park occupies about 99% of the GBRWH Area.

The Federal Government's approval has led to scientific uncertainty whether the criteria the Great Barrier Reef met to be World Heritage Listed will be protected and maintained following dredging and disposal activities. In 1981, UNESCO's World Heritage Committee concluded that the Great Barrier Reef met all the criteria for "*outstanding universal value*" for World Heritage Listing; and noted that "*no other World Heritage property contains such biodiversity*".

The Federal Government's decision is controversial and has led to highly polarised public opinion.

A public opinion survey published by the independent [Essential Research](#) group in February 2014, found that "*17% [of those polled] approve of the decision to allow expansion of the Abbot Point coal port in the Great Barrier Reef and 66% disapprove*".

Potential Dredging Impacts and Risk Management in the GBRWH Area

The potential impacts of dredging and dumping of spoil in the GBRWH Area not only includes environmental harm to an area of high conservation value or cultural significance - but also a decline in water quality and damage to fauna and flora which live on, in, or near the seabed.

Managing risk becomes a complex problem where dredging and disposal activities are undertaken in a location where there is wide variation in size, shape and continuity of "low" and "high" conservation value areas.

This, in fact, is the situation for the GBRWH Area. The listing document submitted to UNESCO in January 1981 to support Australia's "***Nomination of the Great Barrier Reef for Inclusion in the World Heritage List***" describes the nominated area as extending about 2000 km along Queensland's coast - not as a continuous barrier but a broken maze of coral reefs, some with coral cays. Most reefs are submerged, while some are exposed at low tide. There are some 2500 individual reefs ranging in size from less than 1 hectare to more than 100 km², and in shape from flat platform reefs to elongate reefs. The distance separating individual reefs varies enormously - from channels no more than 200 metres wide to as much as 20 km wide.

From the point of view of risk management, the goal of dredging and disposal of spoil in the GBRWH Area should be to manage the potential risk to World Heritage values and to the marine environment to an "*acceptable level of risk*". But, what risk management options exist to achieve this outcome?

The risk could be prevented by dumping the dredge spoil on land; but, cost was a factor in deciding to not take this option. Instead, the option taken was to dump the dredge spoil at a marine location in the GBRWH Area having "low conservation" values.

Dredging Impacts and the Abbot Point Expansion: Divergent Scientific Opinion

The inaugural Chairman and the present Chairman of the Great Barrier Reef Marine Park Authority have divergent scientific opinions on the Federal Government's decision to approve dumping of dredge spoil in the Great Barrier Reef Marine Park.

The opinion of the first Chairman/CEO, Graeme Kelleher, is concern whether the clay fraction in the sediment plume may impact to block sunlight onto corals away from the disposal site. By remaining in suspension "*for a very long time*" and having a "*very, very slow*" settling rate in salt water, clay particles may travel a "*long, long way*"

Kelleher's position is that there may be insufficient scientific evidence to ensure the dredge sediment will not spread further than predicted by mathematical modelling; and that widespread scientific consensus is needed to establish that the approved dredging and disposal activities in the GBRWH Area will have "trivial" impacts on World Heritage values.

On the other hand, the opinion of the current Chairman/CEO, Russell Reichelt, is that the approved dredging and dumping of spoil activities in the GBRWH Area are safe and that there will be no significant impact to the reef's World Heritage values.

Reichelt's position is based on the opinion that 47 extremely strong ("*stringent*") conditions have been imposed; the location of the site for dumping the spoil will be deep water far from any reef - about 25 km E-NE of Abbot Point and about 40 km from the nearest offshore reef; the dredged material will be disposed at a 4 km² site of low conservation value - free of hard corals, seagrass beds and other sensitive habitats; and by having a rigorous ecological monitoring program in place.

Dredging, the Abbot Point Expansion and UNESCO World Heritage Committee Opinion

Scientific uncertainty over the potential risk of dredge plumes causing adverse impacts on the World Heritage values of the GBRWH Area has also triggered a precautionary response from the World Heritage Committee of the UN Agency, UNESCO.

In May 2014, some of its concerns include planned port developments in the GBRWH Area and the Federal Government's approval to dump three million tonnes of dredged material in the Great Barrier Reef Marine Park.

Consensus does not currently exist between the Federal Government and UNESCO whether the "*outstanding universal value*" of the GBRWH Area will be protected. But there is now a timeline for achieving consensus.

On 18 June 2014, the **UNESCO World Heritage Committee** meeting at Doha, Qatar, deferred a decision for 12 months on whether to inscribe Australia's Great Barrier Reef on the "*List of World Heritage in Danger*". This timeline requires Australia to submit a report on the state of conservation of the GBRWH Area, by 1 February 2015, for the World Heritage Committee to consider.

This Report must establish that the "*outstanding universal value*" which led to the inscription of the GBRWH Area on the World Heritage List will not be damaged by dredge spoil disposal; and that no part of the GBRWH Area could be listed as a "*World Heritage Site in Danger*".

Dredging Impacts and the Abbot Point Expansion: Mathematical Modelling

A key component for the Federal Government's Report will be the scientific evidence and mathematical modelling relied on to predict the movement and spread by dredge-generated sediment plumes; and where the particles may settle out of suspension and be deposited in the GBRWH Area.

The **dredge material** from Abbot Bay is "*composed of about 60% sand and 40% silt and clay*". Following dumping of dredged material, there are substantial differences in the length of time these particles remain in suspension - as well as the distance particles travel and spread before settling on the ocean floor.

Generally, fine-grained particles (*clay and silt*) settle out of suspension far slower than coarse particles (*e.g. sand*). The finer silt and clay particles have the greatest **potential to spread** as they remain in suspension and carried away by currents.

Two mathematical models have already been undertaken to assess the likely extent of travel by plume generated from dredging at Abbot Point: One model was commissioned by the Great Barrier Reef Marine Park Authority; another, by the NQ Bulk Ports Corporation.

Scientific Evidence: Dredged Material Dispersion - Reliability of Model Predictions

Mathematical models may vary in accuracy. The two existing models are based on different assumptions. So it is not surprising that they differ in their predictions for the dispersion of dredged

material from the disposal site in both the amount and distances travelled - adding to the scientific uncertainty on the potential impacts by dredge-generated sediment plumes on World Heritage values.

One requirement for ensuring the reliability of the output of any model is to have scientific consensus on the underlying assumptions used to construct the model - as well as having factual evidence, or satisfactory expert opinion evidence, to support the assumptions fed into the computer. This requirement is recognized by both science and the law.

Another requirement for a model to be reliable, recognized by science, is its “sensitivity”. In predicting the movement, spread and settling by dredge-generated sediment plumes in the GBRWH Area, the model should be able to identify and predict small, subtle changes – rather than simply gross changes only – as hydrographical conditions vary from “calm”, “normal” and “rough”.

A key procedural step for any model is the independent validation of the accuracy of the model output carried out against field data - other than the data upon which the model was constructed.

Public Interest Environmental Conflicts & Scientific Evidence

The Abbott Point port development scheme and associated dredging in the World Heritage Listed Great Barrier Reef Marine Park is a classic public interest environmental conflict. The conflict is controversial and awkward. The issues in dispute are complex and numerous. Multiple stakeholders holding competing interests to development and the environment are involved. Information from a very wide range of scientific disciplines will be required. Scientific evidence is the primary source of conflict.

Conflicts over scientific evidence arise through a lack of information, misinformation, and scientific uncertainty, different interpretations of the same information or different opinions as to what information is both relevant and reliable. Scientific round-tables¹ are used to manage and resolve conflict over scientific evidence.

GBRWH Area Legislative Obligations for Sustainable Development & Conflict Resolution

Two Federal statutes are central for the conservation and management of the GBR World Heritage Values and the GBR Marine Park. The *Environment Protection and Biodiversity Conservation Act 1999* prescribes the legal obligations to protect World Heritage Listed Properties. The *Great Barrier Reef Marine Park Act 1975* prescribes legal obligations for the long-term protection and conservation of the environment, biodiversity and heritage values of the Great Barrier Reef Region.

A statutory object in both Acts, prescribes as a legal obligation to either:

- “promote **ecologically sustainable development** through the conservation and ecologically sustainable use of natural resources” (Section 3(1)(b) EPBC Act); or
- “allow **ecologically sustainable use** [consistent with the long-term protection and conservation of the Great Barrier Reef Region]” (Section 2A(2) GBRMP Act).

¹ See Christie, Edward (2008) *“Finding Solutions for Environmental Conflicts: Power and Negotiation”* Edward Elgar Publ., Cheltenham, UK) at Chapter 10, pp. 263-294 for a detailed discussion on this topic and conflict management & resolution.

The legal meaning for *ecologically sustainable development* and *ecologically sustainable use*, as defined in both statutes, contains one common key element: “*decision-making processes should effectively integrate both long-term and short-term environmental, economic, social and equitable considerations*”: Section 3AB(a) GBRMP Act and Section 3A(a) EPBC Act.

From a conflict resolution perspective, finding a sustainable solution that is consistent with this legal meaning requires environmental, economic, social and cultural considerations to be balanced so that environmental costs and economic benefits are not shared disproportionately between Government, industry and the community.

What Options Exist to Resolve the GBRWH Area/Dredging/Abbot Point Conflict?

Litigation is one option. In February 2014, the **North Queensland Conservation Council** filed a legal challenge, in the Administrative Appeals Tribunal, over the Great Barrier Reef Marine Park Authority’s decision to grant a permit to dump dredge spoil in the Great Barrier Reef Marine Park. Litigation by the **Mackay Conservation Group** commenced in the Federal Court in May 2014 to challenge the impacts of the Federal Government’s decision to approve dredging and disposal activities on the World Heritage values of the Reef. In May 2014, **The Association of Marine Park Tourism Operators** announced that it would be taking the Great Barrier Reef Marine Park Authority and the North Queensland Bulk Ports Corporation to the Federal Court challenging the decision to dump dredge spoil from the Abbot Point coal terminal expansion at sea.

Community consultation is an alternative to litigation. A 2014 Report by the University of Queensland’s **‘Centre for Social Responsibility in Mining’** urges mining companies on the need to engage the community to avoid the reaction of local communities to mining developments that can escalate from complaints to protests and road blockades; otherwise, social conflict may result in huge costs in delayed production caused by community pressure and protest.

Dismissing those involved in social conflict over the Abbott Point development as “activists not interested in engagement” fails to recognize that the log in the road for finding sustainable solutions is not those who protest – but the limitations in community consultation and litigation to resolve public interest environmental conflicts.

Litigation and community consultation are processes created in an earlier era to address a very different set of problems. Today, society is confronted with natural and fiscal limits and environmental problems that were unimaginable in the past.

An Alternative Option to Resolve the GBRWH Area/Dredging/Abbot Point Conflict

Is there an option to resolve the Abbot Point/dredging/GBRWH Area conflict, other than litigation or community consultation?

Alternative dispute resolution and negotiation - now an established and accepted process for resolving multi-stakeholder environmental conflicts - is such an option.

Sustainable solutions found using this process are based on joint fact-finding and problem-solving together with shared responsibility for resolving the conflict by negotiation. Where a collaborative approach is used to manage and to resolve a public interest environmental conflict, great care must be taken to ensure all relevant stakeholders holding competing interests are included so that a viable solution can be achieved.

The process of shared responsibility and joint action in finding a sustainable solution must give all stakeholders access to the available relevant and reliable information - as well as an understanding of the scientific/technical data. Decision-making is by consensus.

Effective public participation is a key feature of alternative dispute resolution and negotiation. It ensures: a range of scenarios along a sustainable development continuum, in which the balance between ecological, economic and social and cultural considerations varies, can be evaluated; the outcome is a creative solution that is the preferred option from all options assessed; all stakeholders' needs and concerns are properly taken into account; a sense of ownership in the solution for all stakeholders; standards for environmental protection are complied with, but litigation costs and further appeals are avoided; an outcome that does not produce winners and losers.

Broad groupings of stakeholder interests are generally recognized in environmental conflicts - based on the needs and concerns of each group; in this case, in response to the Federal Government's decision to approve dredging and disposal activities in the GBRWH Area. For the Abbot Point/ dredging/ GBRWH Area conflict, stakeholders having shared responsibility in resolving this conflict would fall within three broad groups: **"Economic"**, **"Environmental"** and **"Community" Interests**. Table 1 illustrates how balanced representation can be achieved.

Table 1: Balancing Stakeholder Interests for Resolving the Abbot Point Dredging Conflict

STAKEHOLDERS: ECONOMIC INTERESTS	STAKEHOLDERS: ENVIRONMENTAL INTERESTS	STAKEHOLDERS: COMMUNITY INTERESTS
1. Government	1. World Heritage	1. Local Community
2. Miners	2. Marine Conservation	2. Indigenous
3. Tourism Operators	3. Water Quality	3. Youth
4. ...	4. ...	4. ...

Conclusions

United States experience, indicates that *"no other strategy offers a more telling acknowledgement of the legitimacy of local concerns"* than those who have to live with the outcome of a conflict resolution process know that they can trust the environmental monitoring and management plans.

A bottom line for shared responsibility and joint action in negotiating this conflict (which would be non-negotiable) must be that the "outstanding universal values" which led to the inscription of the

GBRWH Area on the World Heritage List are not damaged by dredge spoil disposal; and that no part of the GBRWH Area could be listed as a “World Heritage Site in Danger”.

HYPERLINKS

Page 1:

Essential Research

<http://essentialvision.com.au/approval-of-port-expansion-in-great-barrier-reef>

Page 2:

Kelleher’s position

<http://www.abc.net.au/worldtoday/content/2013/s3939625.htm>

Reichelt’s position

<http://theconversation.com/lets-dump-great-barrier-reef-dredging-myths-authority-chief-22991>

Page 3:

UNESCO World Heritage Committee

<http://whc.unesco.org/en/news/1149/>

dredge material

<http://theconversation.com/lets-dump-great-barrier-reef-dredging-myths-authority-chief-22991>

potential to spread

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Two mathematical models

<http://www.nqbp.com.au/wp-content/uploads/2013/12/QAs-Abbot-Point-Dredging-December-2013.pdf>

Page 5:

‘Centre for Social Responsibility in Mining’

http://www.hks.harvard.edu/m-rcbg/CSRI/research/Costs%20of%20Conflict_Davis%20%20Franks.pdf

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