2017 IECA Award of Environmental Excellence

Coffs Harbour Slipway – Contaminated lands rehabilitation.

Soil Conservation Service NSW

Section 1: Marketing statement

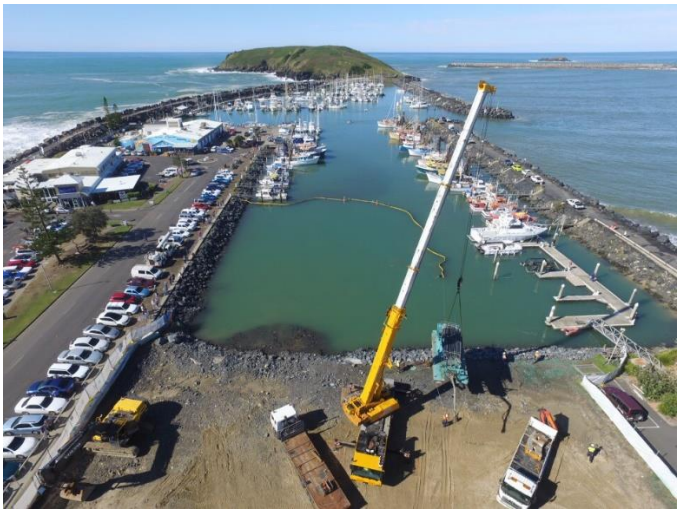
How do you remove over 4,000 tonnes of contaminated sediment from a site that is more than 50% submerged in water up to 6 metres deep? This was the challenging question that faced a team from The Soil Conservation Service when they undertook a project for The Department of Industry- Lands, removing contaminated materials from Coffs Harbour's high-profile slipway.

Laden with bio-accumulating contaminates such as nickel, lead and Tributyl tin, the sediment had to be removed and isolated, with minimal impact to the surrounding environment or general public. In fact, expert project management and innovation by the Soil Conservation Service resulted in removal of more contaminated material than was originally intended, whilst bringing the project in under budget.

This was achieved by liaising with stakeholders including the EPA to change the construction methodology. The final methodology reduced the environmental and human health risk associated with the contaminants, recovery of the maximum amount of materials possible for re-use as well as allowing a greater amount of impacted material to be removed.

The site is extremely sensitive in nature given its proximity to government infrastructure, private enterprise, general public and the The Solitary Islands Marine Park.

A four-minute mini-documentary documenting the project has been watched hundreds of times on YouTube and shared across multiple social media channels.



Franna Crane Lifting In Dredge AS THE East coast low subsides

Section 2: Abstract

2017 Awards of Environmental Excellence
Coffs Harbour Slipway – Contaminated Lands Remediation

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Located half way between Sydney and Brisbane, Coffs Harbour is one of only 6 international Marina's in NSW. Commercial, private and tourism operators work out of this 165 berth marina just outside the Solitary Islands Marine Park. The 100 tonne Coffs Harbour Slipway was constructed in the early 1970s and was used for ship maintenance and repair until regular operations ceased in 2014. These activities resulted in contamination of terrestrial and marine sediments. Contaminant assessments formed the basis of a remedial action plan (RAP) supplemented by a technical in October 2015.

The site is extremely high profile and sensitive in nature given its proximity to government infrastructure, private enterprise, general public and the marine environment.

The Soil Conservation Service (SCS) was engaged by The Department of Industry (DoI)- Lands to undertake the site remediation works in line with the RAP/Specification.

The SCS heavily altered the construction methodology proposed in the Specification to reduce environmental and human risk. This was done by moving from a land based approach to dredging campaign. Using an in-line flocculant and geo-synthetic de-watering system for marine sediments meant that the contaminants were isolated at all times. This resulted in a safer and cleaner job with less impact on the public. This methodology also resulted in over 4,760Tonnes of contaminated sediment being removed, far more than originally planned.
Contaminated Terrestrial sediments were isolated and then stabilised using Vital Chemical's Stonewall to limit contaminated dust issues on site and for adjacent stakeholders.

This project was extremely challenging for a number of reasons including:

- The Remediation Action Plan and Technical Specification had a number of gaps or errors in data, methodology and many unknowns.
- The site itself had an extremely small footprint for the desired works with approximately half the construction site submerged at up to 6 metres.
- Contaminant testing results have a minimum two week turn around making real time monitoring of both marine and air quality unattainable.
- Final tonnages for offsite disposal of materials were dependant on de-watering to result in an unknown final weight for each m3 of dredged sediment.
- The June 2016 East Coast Low hit mid works. This resulted in numerous vessels within the harbour sinking and the need for emergency vessels to frequent the marine works area.

The SCS's innovative and flexible approach to the works was able to achieve and improve upon all desired outcomes, save money and save the environment within a very harsh timeframe. The success of this project has become the expected benchmark for similar works by the local EPA office and DoI Lands-Coastal Infrastructure Group.

Section 3: Location, beginning, respective milestones and completion dates.

100Tn Coffs Harbour Slipway with Vessle prior to works. Note the drainage pits in the foreground that go under during high tide.

This project was undertaken at the former Slipway site in the Coffs Harbour Marina. The project started on the 14th March 2016-24th July 2016

MARCH - Site establishment/ procurement

APRIL-Mobilise plant/ deploy ERSED Controls/slipway removal

MAY- Slipway removal/ resource recovery

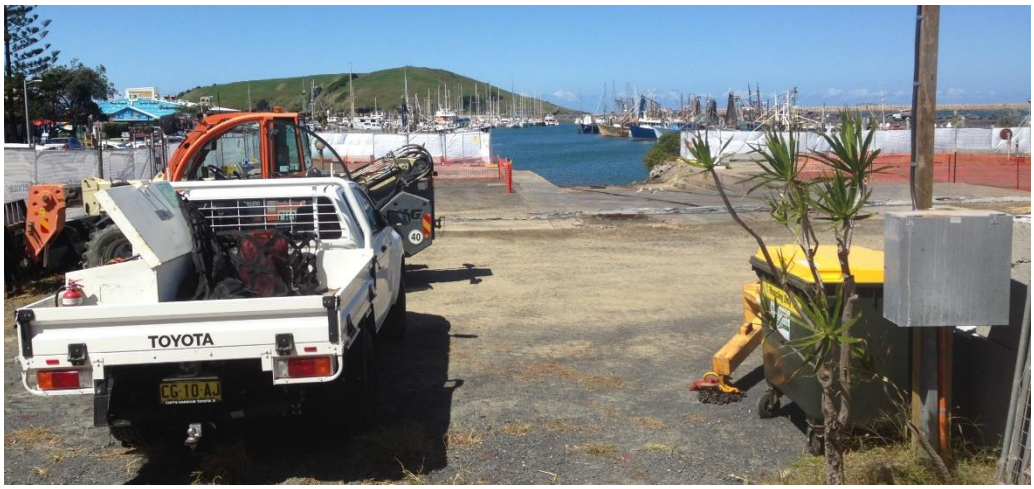
JUNE- Dredging and dewatering

JULY- Removal off site of contaminated de-watered materials/ reinstate hardstand/ validation.

Client: Department of Industry- Lands

Contractor: Soil Conservation Service

Sub Contractors: NM AA Foley Contracting, Jaybro, North Coast Cranes, GHD, Burnett Civil, Clarence Earthmoving, Remondis, Bastow Earthmoving, Commercial Diving Solutions, Enviropacific Services, Sandman Dredging, Coastal Media, Conplant, Coastes Hire, Polyfabrics Australasia, Complete Staff Solutions, Resource Design and Management, Handybin Waste Services, Tutt Bryant, Van Den Berg Earthmoving and Vital Industries



Not a bad view from the office

Section 4: Distinctive features, special accomplishments, difficult challenges and other unique aspects.

Limited operational space and resource recovery-

Over half the site was submerged at a maximum depth of 6 metres. Requirements for the terrestrial dredging pad took up around 80% of the effective terrestrial space on site making truck movements problematic.

The SCS was committed to as much resource recovery as possible including rock ballast, rail and sleepers which all needed to be stockpiled onsite and validated prior to re-use or transport offsite.

The ballast material was not able to be recovered by excavator as proposed in the specification. To maximise resource recovery the SCS brought in a shaker screen to split the rock/sediment matrix into different waste streams for recovery.

Shaker Bucket used to split various rock sizes

Working in a high profile and contentious area-

The immediate stakeholders directly adjacent to the work site included Crown Lands, NSW Fisheries, Solitary Islands Marine Park, Water Police, Marine Rescue, Commercial Fishing Trawlers, Private Tourism Operators, Private business and resteraunts and the General public given The Harbour is a tourism feature of the area.

Working to a harsh timeframe-

Harsh time constraint due to a political promise meant that there was no room for error in the delivery timeframe on this site. I was on leave after marrying my wife when I got the call to get the job happening. Two weeks later we hit the road for Coffs Harbour to get it done.

One major issue overcome was the inability of the awarded dredging contractor to do the works in the required timeframe. This resulted in another contractor being engaged at very short notice.

Recovery of submarine section of the slipway.

Working with contaminated sediments onsite and interstate-

The bio-accumulating contamination on the site was a threat to the marine environment and in particular oyster populations which were extremely susceptible in shorter time frames. The removal of this sediment and the hot spots will continue to improve the health of this ecosystem for many years.

The Remediation Action Plan and technical specification left a lot to be desired with a number of gaps or errors in data, methodology and many unknowns. The SCS had to make on ground decision's as the job progressed with limited information and adjust the project as necessary.

Full PPE during handling of Hazardous Materials. Uncomfortable in the heat to say the least. A challenge for workers

Results for testing of the contaminant Tributyl Tin takes a minimum of two weeks to turn around. This means that real time monitoring of the contaminant exposure and levels was unattainable. This issue was bypassed in the marine environment by adopting an NTU correlation in agreement with the EPA to create appropriate trigger values as the basis of a water quality monitoring plan to undertake testing in real time. The terrestrial side of the works had to take all care to limit exposure of staff and the general public. All terrestrial dust monitoring testing came back below readable levels throughout the entire project indicating no contaminated dust movement.

Another challenge was fulfilling all requirements by N.S.W EPA and gaining all approvals by Q.L.D EPH in a timely manner. N.S.W EPA required waste tracking certification for all truck movements with final documentation to rest with the Q.L.D EPH. QLD EPA unsurprisingly had no idea what the documents were as they don't require them and notably mentioned that I could send them if I wanted but they would be filed in the shredder as they have no use for them. We decided a better option was to keep them on a local file with the NSW EPA. A small taste of the many issue's working cross border with department's that have different policies and legislation.

Geosynthetic Bags filled with contaminated sediment after de-watering being loaded out to waste management facility.

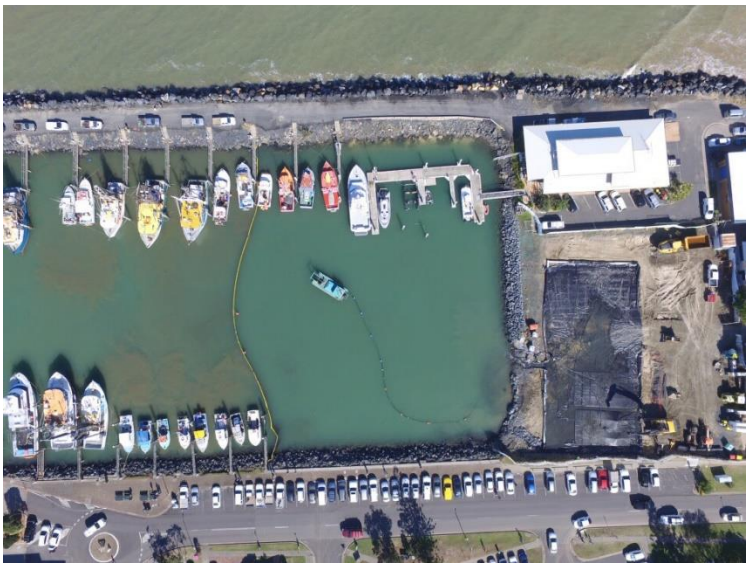
Erosion and Sediment Control-

Dealing with contaminated sediments meant that erosion and sediment control was of even more importance than usual. Given that testing results were not available until 2 weeks later it was extremely important that we take all necessary precautions to managing exposure as real time monitoring was problematic. All monitoring results came back below readable levels which was an excellent outcome.

Terrestrial- Dust control was an extremely big issue on the extremely exposed site. Heavy grade shroud encased the fence line of the entire site to minimise wind fetch. Known contaminated areas were isolated from use and the entire site stabilised and regularly maintained with Stonewall tackifyer to bind sediment and minimise potentially contaminated dust.

Marine- With coffer dam construction to undertake dry works unfeasible two surface to sea bed sediment booms were deployed to contain the construction waters. This was only feasible due to the relatively low energy environment within that portion of the marina and steady tidal fluctuations. These booms were a source of many issues throughout the project and their non-conformance to intended standard use created numerous problems with maintenance.

Some of these issues included placement and maintenance, pinning of the curtain and a fish kill incident (Outlined Below). This being said they performed extremely highly in their ability to create a barrier to the "natural" marina waters and our site construction waters.



Start of Dredging Operations only days after the East Coast Low: Note Work area within Boom is cleaner than the natural harbour.

Requirement to work outside of designed applications for sediment controls-

Two separate surface to sea bed (curtain depth up to 6 Meters draft) sediment booms were imposed as a requirement by the EPA. Working outside of the design intention for sediment booms, which are not intended to extend to the sea bed had a range of expected and unexpected consequences. Placement and maintenance of the booms needed to be undertaken by commercial divers in very low visibility. As the slipway was recovered at low tides and sediment was mobilised it moved towards the inner boom and settled out on the excess curtain available at that tidal range. This resulted in the boom slowly becoming pinned and not recovering with incoming tides.

The double boom system caused a closed system with little to no water mixing. When thousands of whitebait were driven in between the booms overnight the sudden mass of biota in the limited space crashed the inter-boom Dissoved Oxygen levels rapidly resulting in severe fish kill. Water

quality monitoring and agreement with the EPA resulted in the opening of the outer boom ends to prevent further occurrence with the secondary curtain able to be closed in the case of a breach.

Sediment Booms working as intended.

Environmental Conditions

These works were particularly tide dependant and construction activities needed to consider tide on a daily basis.

The June 2016 East Coast Low hit mid works resulting in numerous vessels within the harbour sinking and the Marina Office destroyed. This meant that emergency vessels were required to frequent the marine work area and the SCS needed to find a way to deliver this.

The site was well prepared for the Low with site fencing weighed down with 1tn blocks, All contaminated materials stockpiled at a high point on the site, bunded, stabilised with tackifyer and covered in geotextile fabric to prevent contaminant transport. With general waste materials cut out to leave a bunded dewatering pad the site was only inundated at this cut level and only impacted the dewatering pad resulting in a half day to rework levels and place plastic liner. The dredge was launched the day after the subsidence of the East coast Low.

Section 5: Quantifiable benefits the entry has contributed to the environment, the community and the erosion control industry and your company/ organisation

If the job was undertaken by private contractors and adhered to the specification the works would not be anywhere near as successful in both environmental and cost benefit outcomes.

Removal of bio-accumulating contaminants from a marine ecosystem will continue to improve health in the local environment for many years including the re-establishment of oysters previously heavily affected.

The site is now fit for future continued use and the works have allowed improvements to be made to the internal breakwaters and Marina including a new public pontoon.

This project further proves that the SCS is a leading agency in delivering challenging environmental work in difficult environments.