

# Bushfire demolition waste recovery facility

## COUNCIL NAME

Shoalhaven City Council

## WEB ADDRESS

[shoalhaven.nsw.gov.au](http://shoalhaven.nsw.gov.au)

## SIZE

4,567 square kilometres

## POPULATION

104,371

## Overview

The NSW south coast was severely impacted by the devastating bushfires of the 2019/2020 summer with over 300 homes in the Shoalhaven destroyed and 150 houses impacted. In order to preserve the capacity of its only putrescible waste landfill, Shoalhaven City Council opted to set up a temporary bushfire demolition waste processing facility. Any demolition waste that was unaffected by asbestos contamination was able to be recycled. In the 3 months of operation the facility processed nearly 18,000 tonnes of demolition waste from 313 homes, recovering a staggering 96% of the material for reuse.

## Background

The bushfires had a devastating effect on the local community with 301 homes, 22 facilities and 560 outbuildings totally destroyed and another 403 structures that were damaged in the Shoalhaven alone. The NSW EPA together with Public Works Advisory (PWA) were tasked with managing the clean-up. PWA approached Council in early January 2020 to find out what capacity council's landfill had for accepting demolition waste from the clean-up of fire impacted houses within the area. The PWA estimates of waste volumes, based on modelling developed after the Tathra bushfires, were 63,600m<sup>3</sup> of asbestos contaminated waste and 50,400m<sup>3</sup> of non-asbestos (clean) waste. Council strongly advised PWA that the asbestos contaminated material should be taken to bulk asbestos waste facilities, of which there were two in the region, so that the landfill capacity of Shoalhaven's only putrescible landfill could be maintained.

After inspecting some of the devastated areas, Council believed that a high proportion of the non-asbestos material could be reclaimed. Council's assessment showed that it was possible to recover up to 60% of the material. The ability to recycle most of the demolition waste was attractive in that it:

- reduced the reliance on landfill to dispose of the material;
- resulted in a lower cost option for managing the bushfire demolition waste stream; and
- achieved an environmentally sustainable solution to manage a disaster.



## Implementation

The recycling plant was designed to accept a throughput of 720 tonnes per day and involved the construction of:

- A 2,000m<sup>2</sup> waste receival hardstand area bordered by mass concrete blocks formed in a U-shaped wall;

- A 3,000m<sup>2</sup> first stage back-of-house sorting area. Two excavators with various attachments (magnets, shears), a materials handler, a three-way screen and two elevated conveyors operated in this first stage. Clean concrete and clean steel was initially separated and placed in bins for transport to local recyclers. The remaining material was screened into coarse, medium and fine fraction and stockpiled for further cleaning.
- A 4,000m<sup>2</sup> second stage refining process. Concrete and bricks and waste for landfill were stockpiled in this area and refined by processing through a waste shredder and a concrete crusher (with different size screens).

Six staff were brought in to manage the process, being sure to maintain strict COVID 19 safety protocols. All material was tracked at the weighbridge, so that it can be linked back to each property with the property ID, truck registration, date and tonnes.

Safety was paramount on site. Apart from the normal heavy plant safety precautions, Council needed to have mitigations in place for managing stray asbestos fibres in the waste loads. Inspection of all loads was undertaken on delivery with backup air quality testing and monitoring.

The primary markets for the materials consisted of:

- Scrap steel which was sold to a local scrap metal recycler in Nowra.
- Concrete was initially taken to local concrete recyclers in Nowra. However, they reached their full processing capacity quite early in the process. The concrete was then stockpiled on site and Council hired in a concrete crusher to complete the crushing. The product is ideal for use as a recycled pavement material and is being used for in-house infrastructure works at Council's ten recycling facilities. The works includes a glass washing and recycling plant under construction (to be operational in August 2020), a pop-up transfer station for commingled recycling (in July 2020) and a proposed Materials Recovery Facility (MRF) planned to commence in 2021.
- Bricks and mixed concrete were also crushed on site for use at Council facilities.
- The fine fraction material is being used as a daily cover at the landfill site and blended with other materials for use in final rehabilitation on site at West Nowra recycling and waste facility.
- Tree stumps and other organics have been shredded and added to Council's extensive organics recycling program. This material is pasteurised in windrows and processed into a pasteurised organic product and offered to residents at no charge.

## Outcomes

A total of 17,797 tonnes of bushfire demolition waste was received from the PWA contractor, Laing O'Rourke. An additional 832 tonnes was received from local contractors outside of the Government assistance. The recycling results are as:

- Scrap steel - 1,720 tonnes (10%) sold to local recyclers.
- Medium fraction brick and concrete – 4,393 tonnes (25%) with some to a local recycler and the rest crushed and utilised in-house.
- Concrete – 2,929 tonnes (16%) with some to a local recycler and the rest crushed and utilised in-house.
- Recycled fines – 8,044 tonnes with some utilised for daily landfill cover and the rest mixed with other soils as landfill rehabilitation material.
- Timber and roots and stumps – 4 tonnes shredded together with normal green waste, processed into a pasteurised organic product and given away to residents. The remaining 707 tonnes (4%) of this material was shredded and disposed of to landfill.

Recycling of bushfire demolition waste has not been performed like this in any other known location in Australia. Council used traditional plant and equipment and, with a number of screens, magnets, shears and shredders, were able to sort through the material and extract 96% for reuse or recycling. Simply putting a machine into place to achieve these results is not effective. The plant operators need to develop a working methodology where repeatedly

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working and reworking the stockpiles to refine the product and remove the extraneous waste achieved a higher level of product purity and diversion.

## Key Learnings

It took some time for the government agencies to award a contract for the demolition and clean up and to agree on the terms for Council to accept and recycle waste. Knowing that when the button was pressed, it would need to accept waste immediately, Council took the risk of setting up the sorting facility in 4 weeks so that it could be operational within a day when PWA gave the order to go ahead. The set-up included the construction of the hardstand, hire of plant and equipment and re-arranging rosters so that trained and suitable staff were available.

The project commenced just prior to the NSW COVID 19 regulations and controls coming into force. The impact on the operation focussed on avoiding potential cross contamination. Only one team of staff was assigned to the project, one person on one machine with regular and ongoing decontamination of the cabins. All communications with incoming truck drivers was done via 2-way radio.

The material that could not be recovered was shredded. The opportunity to use some of the material as processed engineered fuel (PEF) was lost because the market was closed due to restrictions on shipping. The shredded material went to landfill.

Gas cylinders were retrieved from nearly every home that was demolished. The gas cylinders were generally severely impacted by the fires and unsafe to reuse. They were separated from the scrap steel and a specialist recycler collected them for recycling. Some of the operators, who were working in the processing plant, live in fire impacted areas. Processing demolition materials from homes of people they know or who are their neighbours took a significant emotional toll. This was an unexpected consequence of a robust technical and practical planning process. The psychological impact is real and should be considered as a major part of the planning process in future disasters.

## Contact

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**This project was the 2020 winner of the Resource Recovery Award at the LGNSW Excellence in the Environment Awards**