

# Cadia Continued Operations Project

## PROJECT INFORMATION SHEET ISSUE #5 - CYCLONED SAND TAILINGS

As introduced in Project Information Sheet #1, Newcrest has commenced planning for a long-term continuation to mining operations known as the Cadia Continued Operations Project (CCOP).

July 2022

## Introduction

The Cadia Continued Operations Project (CCOP) will generate tailings as an uneconomic by-product from gold processing. Tailings consist of ground rock and ore processing reagents and are a normal output from mining operations. At all mines the tailings must be safely stored in an engineer-designed facility that is built to stringent standards.

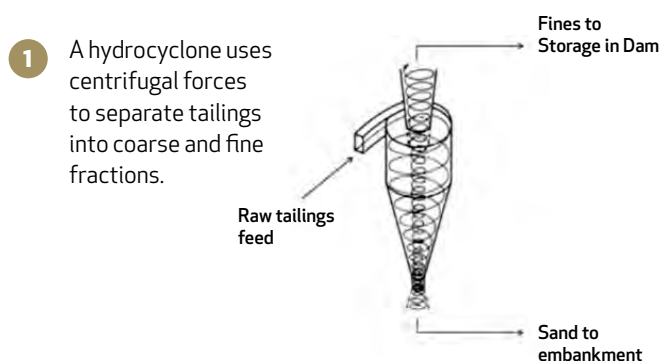
Newcrest Mining is proposing to construct a new Tailings Storage Facility (TSF) immediately south of the existing site TSFs which are used to store tailings from current production. The engineered embankments of the TSF are proposed to be constructed from hydrocycloned-sand tailings. The proposed location and construction methods for the new TSF were selected following a detailed review of available locations and technologies.

To support TSF design, Newcrest Mining has engaged Klohn Crippen Berger (KCB), an international engineering consultancy. KCB are industry leaders in tailings management and pioneered the design and construction of hydrocycloned sand in tailings embankments over 50 years ago.

## What is hydrocycloned sand?

Tailings embankments are usually constructed using materials sourced from quarries, or from overburden from mine operations. Hydrocycloning of the tailings waste stream to separate the sand (hydrocycloned-sand) from the tailings will provide material for construction of the new TSF embankments.

An overview of the hydrocycloning process is presented below:



**2** Once separated, the coarse sand (hydrocyclone underflow) is delivered to, and hydraulically deposited into cells on the embankment for compaction.



**3** The finer fraction is discharged into the facility behind the progressively raised embankment. Water is collected and returned to the process for reuse.



The construction of a new TSF using hydrocyclone technology will not significantly change the way the mine operates but does have the advantage of significantly reducing the size of the TSF compared to traditional construction techniques.





## Why use Hydrocycloned sand?

Hydrocycloning of tailings was developed in the 1960s and continues to be used globally as a safe and reliable method of embankment construction. Hydrocycloned-sand embankments have the following benefits:

- **Embankment safety:** minimising pore pressures within an embankment contributes to its stability. Hydrocycloned sand provides a wider zone of drained material and reduces the need for filter zones.
- **Beneficial reuse of material:** re-purposing the waste materials to construct the dam embankments reduces the quantity of material stored within the TSF, therefore reducing its size.
- **Beneficial reuse of water:** During the hydrocycloning process, water is recirculated to the process which reduces the reliance on freshwater from other sources.
- **Reduced land disturbance:** as tailings are used to construct the facility the size of the facility and the amount of quarrying is reduced. This in turn reduces land disturbance and impacts to biodiversity and cultural heritage.
- **Progressive reclamation:** finished TSF surfaces can be progressively reclaimed as completed.
- **Reduced energy:** hydrocycloned sand construction uses less energy than some other tailings technologies while maximising the amount of water reuse.

# Are there global examples of embankments constructed from sand?

Constructing TSFs from hydrocycloned sand and tailings is a common practice in North and South America and other mining jurisdictions. The practices have been safely applied across a range of climatic conditions, topographies and ore types. A few global examples include:

Mine & Location	Mine type	Mine life-cycle phase	Description
<b>Highland Valley Copper</b> British Columbia Canada	Copper-molybdenum	Operations (1969 -present)	 A 3km long centreline hydrocycloned sand tailings embankment. The embankment height will be approximately 140m at mine completion. <sup>1</sup>
<b>Kennecott Mine</b> Utah, USA	Copper	Operations (1906 -present)	 An embankment was constructed from hydrocycloned sand as part of the mine tailings modernisation project. It is approximately 13km long and 75m high, and encompasses the northern tailings impoundment which has an area of approximately 1,400Ha. The northern embankment has a similar perimeter configuration to the proposed Cadia TSF. <sup>2</sup>
<b>Brenda Mine</b> British Columbia Canada	Copper-molybdenum	Closed (operations 1968 -1990)	 A 2km long hydrocycloned sand embankment constructed by cell deposition between a pair of rockfill starter embankments. This project was pioneering for hydrocyclone sand construction and the embankment is 137m high. <sup>3</sup>
<b>Cerro verde</b> Peru	Copper	Operations	 A 2.5km long centreline hydrocycloned sand tailings embankment. The embankment height will be approximately 260m at mine completion. The tailings facility is in a region of high seismicity dominated by earthquakes occurring along the Peru-Chile Subduction Zone. <sup>4</sup>

<sup>1</sup> <https://www.teck.com/sustainability/sustainability-topics/tailings-management/dam-safety-inspections/>

<sup>2</sup> Direct communications with Site Team

<sup>3</sup> [http://mssi.nrs.gov.bc.ca/Brenda/Brenda\\_2014\\_DSI.pdf](http://mssi.nrs.gov.bc.ca/Brenda/Brenda_2014_DSI.pdf)

<sup>4</sup> Obermeyer, J., Alexieva, T. (2011). Design, Construction and Operation of a Large Centerline Tailings Storage Facility with high rate of rise. Proceedings Tailings and Mine Waste 2011.

## How can I be involved?

Both Cadia and Umwelt would like to continue to engage with you to understand your views regarding the proposed tailings storage options. Your input will continue to inform the project design and contribute to the preparation of the Social Impact Assessment (SIA) for the project.

If you would like to provide any input in relation to tailings storage options, or the CCOP more generally, please:

- contact us directly (as per the contact details below) or to arrange a meeting time
- scan the QR code below (which provides a link to a feedback form), or
- contact the Umwelt team at: [social-team@umwelt.com.au](mailto:social-team@umwelt.com.au)



<https://ccopsia.questionpro.com>

## Contact the Newcrest team

General feedback or questions are encouraged through emailing: [c.copeis@newcrest.com.au](mailto:c.copeis@newcrest.com.au)

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Website and Interactive Map of CCOP:



<https://caportal.com.au/umwelt/cadia>