



Containerised Bulk Handling

Zero Loss Handling Supply Chain



Load Ship



Grab to Hopper



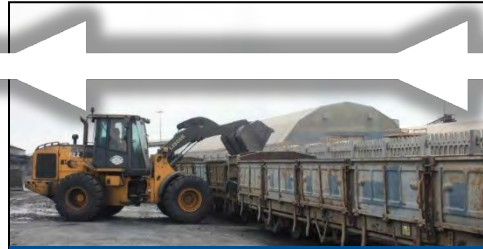
Hopper to Stockpile



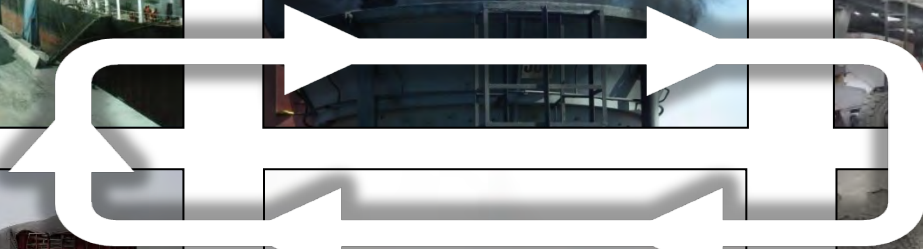
Transport to Port



Load Train | Truck



Open Stockpile



CURRENT BULK LOGISTICS



Many companies are having to look at systems **to reduce** levels of contamination to meet current environmental guidelines





FLEXIBLE SYSTEM

Benefits of CBH

- ✓ Containers are sealed and tracked end to end No dust, No loss of material
- ✓ Containers can serve as bulk storage, transport and loading tool
- ✓ Provides for broader service handling various commodities with less staff
- ✓ Maximize payload on truck and rail and reduce capital cost on fleet
- ✓ No open stockpile. Eliminates re-handling at intermodal facilities
- ✓ System setup within 6 months Faster route to market
- ✓ System is fully movable, expandable and provides for contingencies
- ✓ It is flexible and can integrate into any type of Port facility & logistics process.

EQUIPMENT NEEDED AT THE PORT

RAM REVOLVER



BLUE WATER MISTING SYSTEM



TYPES OF RAM REVOLVER

Video: <https://vimeo.com/272747924>

MHC Cranes



Ship to Shore Cranes



Bridge Cranes



ARMG / RMG Cranes



Ship Cranes



Reachstacker



ISG CONTAINERS



ISG LID LIFTER



SKELETON TRAILERS



ISG Container Brochure: https://pittoship.com/wp-content/uploads/2019/09/PTS-Bulk-Container-Brochure-2019_Rev1_PRINTERS_reduced.pdf

A FLEXIBLE SYSTEM

1: Pit to Ship



BENEFITS

1: Pit to Ship

Video: <https://vimeo.com/159523195>

- ✓ Uses container as transport, storage and loading
- ✓ Secure and safe end to end – no contamination in or out
- ✓ Sampling can be performed at the mine
- ✓ No need for fixed bulk and ship loading facilities with the use of current berth
- ✓ Leverage existing port equipment such MHC, STS, RS and Ship Cranes
- ✓ Fast loading rates depending on crane and number of rotating spreaders
- ✓ Portable and expandable

2: Pit to Shed



Transport



OR

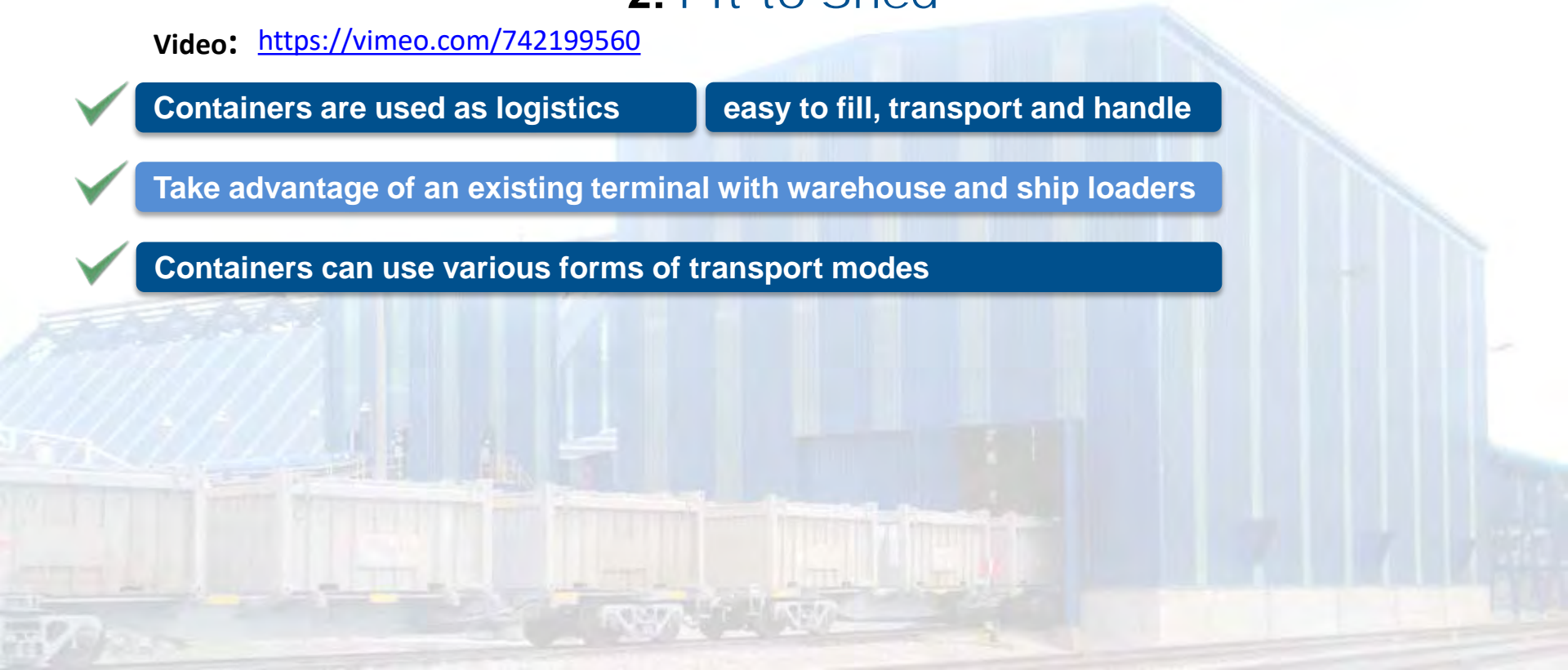


BENEFITS

2: Pit to Shed

Video: <https://vimeo.com/742199560>

- ✓ Containers are used as logistics easy to fill, transport and handle
- ✓ Take advantage of an existing terminal with warehouse and ship loaders
- ✓ Containers can use various forms of transport modes



3: Shed to Ship Internal

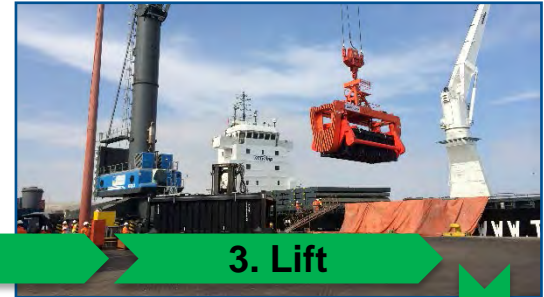


3: Shed to Ship **Internal**

Video: <https://vimeo.com/731693431>

- ✓ **Storage Warehouse on dock**
- ✓ **Fast short loop with 10 containers loaded in the warehouse**
- ✓ **No product is then loaded on dock by grabs**
- ✓ **Clean operation compared with conveyors and grabs**
- ✓ **Maximize payload in-terminal**

4: Shed to Ship External



BENEFITS

4: Shed to Ship **External**

Video: <https://vimeo.com/570320520>

- ✓ Warehouse is several kilometres from the Port
- ✓ 50 to 100 containers can be charged and ready on dock
- ✓ Ship arrives then containers are sent in a loop.
- ✓ Due to container buffer then it minimises waiting for trucks
- ✓ Fast load rate due to buffer
- ✓ Congestion at the warehouse or entrance to the Port doesn't affect the operation due to the buffer

5: Pit to Ship-Loader



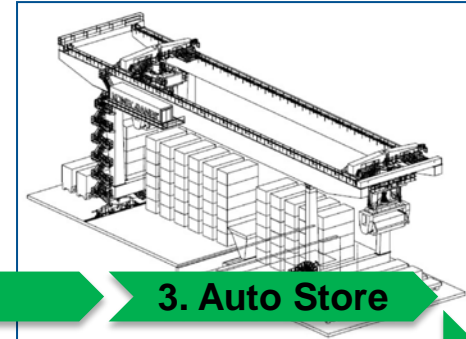
BENEFITS

5: Pit to Ship-Loader

Video: <https://vimeo.com/551417941>

- ✓ Loading with a Shiploader at 1500TPH
- ✓ Integrating with a dedicated Bulk Terminal
- ✓ Containers are brought in and stored at the Port
- ✓ Achieve high rate of loading with a Shiploader

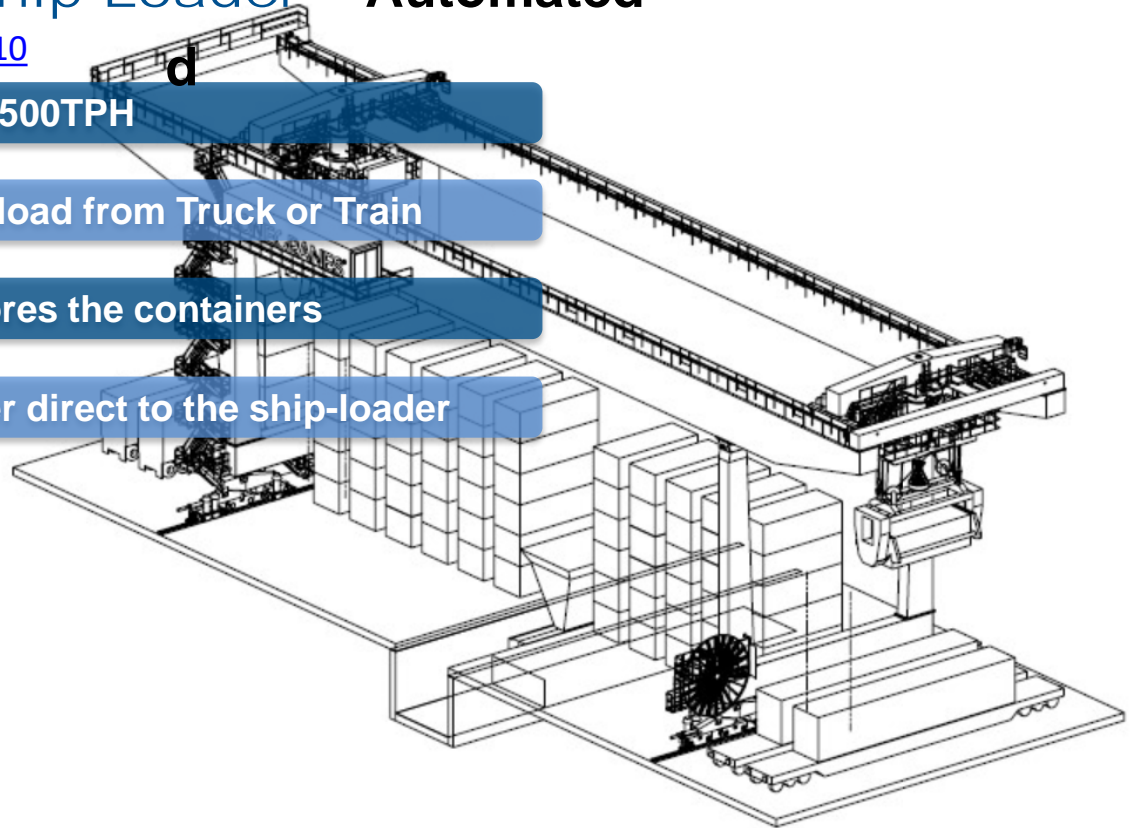
6: Pit to Ship-Loader - Automated



6: Pit to Ship-Loader – Automated

Video: <https://vimeo.com/743350010>

- ✓ Loading with a Shiploader at 1500TPH
- ✓ Automated Crane to unload & load from Truck or Train
- ✓ Automated Crane stacks & stores the containers
- ✓ Automated Crane loads hopper direct to the ship-loader



A FLEXIBLE SYSTEM

7: Pipe to Ship



1. Pipeline



2. Dewater



3. Fill



6. Load



5. Store



4. Transport

BENEFITS

7: Pipe to Ship

- ✓ **Concentrate sent to Dedicated Mine Port by Pipeline & dewatered**
- ✓ **Contingency Plan B – CBH used**
- ✓ **After dewatering the containers are filled as Plan B**
- ✓ **CBH used if Shiploader breaks down or bad swell at the terminal**
- ✓ **Miner can ship product to another local CBH Port as Plan B**
- ✓ **Miner can now ship 365 days per year**

FLEXIBLE SYSTEM

8: Pit to Rail Gondola



2. By Truck

Transport



8: Pit to Rail Gondola

Video: <https://vimeo.com/827272900/e848570a02?share=copy>

- ✓ **Loop of containers from the Mine to the Rail Intermodal station**
- ✓ **Existing hopper rail cars only available & no flat cars.**
- ✓ **CBH fits in with any type of operation.**
- ✓ **Clean operation to transfer from Truck to Rail.**
- ✓ **Reduces handling and material loss.**

9: Ship to Shed - Import



BENEFITS

9 : Ship to Shed (*Import*)

- ✓ Containers are filled from a grab to hopper
- ✓ No contamination throughout the logistic process
- ✓ No loss of material
- ✓ Ideal for Truck to Train Transfer
- ✓ Containers can be used as storage.

CBH USED AS A CONTINGENCE

Issue:

If Ship loader breaks down or conveyor has a fire.

Port has bad swell or strike or long waiting/demurrage time.

Solution:



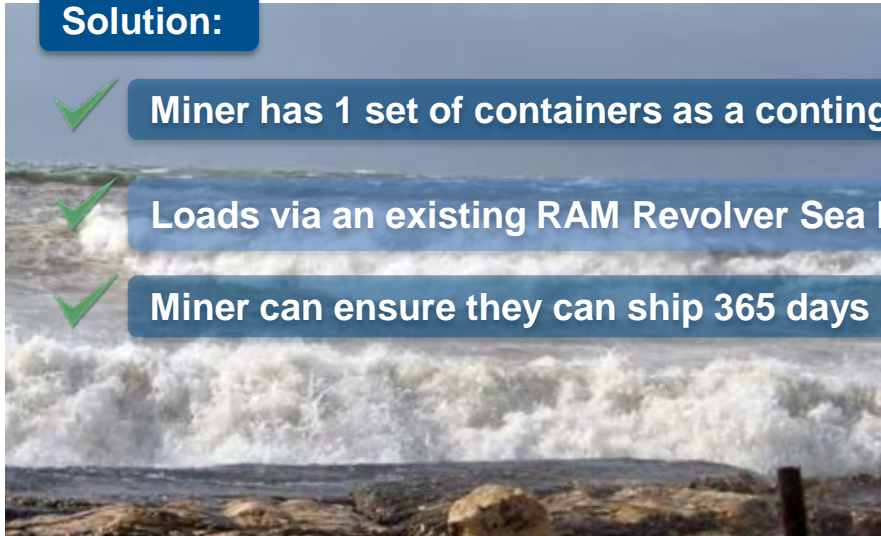
Miner has 1 set of containers as a contingency



Loads via an existing RAM Revolver Sea Port if an issue.



Miner can ensure they can ship 365 days of the year



TRANSPORT OPTIONS



Higher Payload Capacity

Optimize truck fleet on the road

No Product Loss
Theft Proof

Safe and Secure

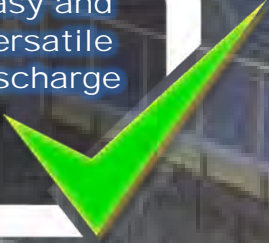
Can be Leased

Reduce Opex & Capex per operation fleet

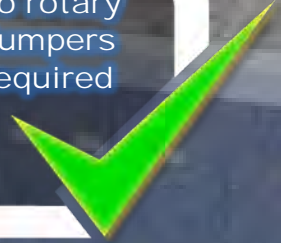
15/20 years Average Life

TRANSPORT OPTIONS

Easy and
Versatile
Discharge



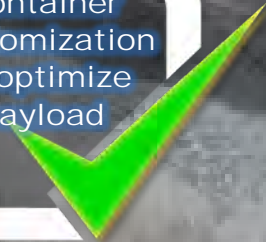
No rotary
dumpers
required



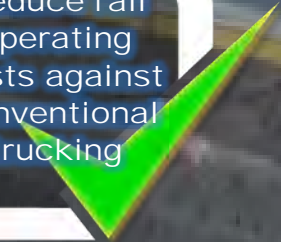
Long Haul
Cost Effective



Container
customization
to optimize
payload

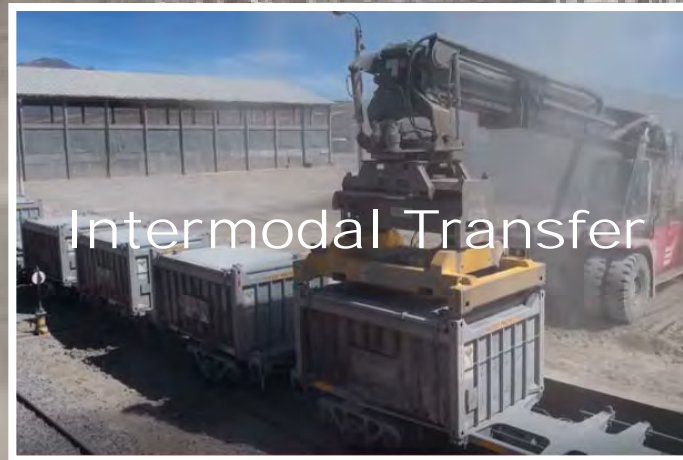
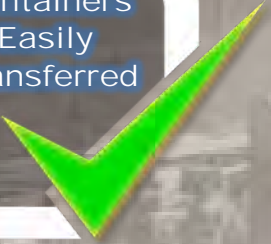


Reduce rail
operating
costs against
conventional
trucking



TRANSPORT OPTIONS

Containers
Easily
Transferred



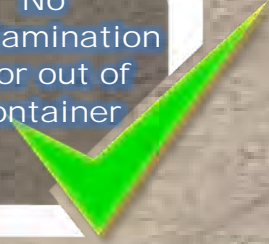
No need to
build Bulk
Transfer
Facility



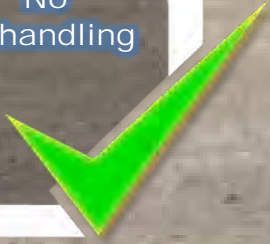
Long Haul
Cost Effective



No
Contamination
in or out of
Container



No
re-handling





Containerised Bulk Handling REFERENCES IN THE AMERICAS

***Listed from South to North*



ARGENTINA – 1

CBH CLIENTS IN THE AMERICAS



Video: <https://vimeo.com/595236123>

TERMINAL PUERTO ROSARIO

Rosario, Argentina



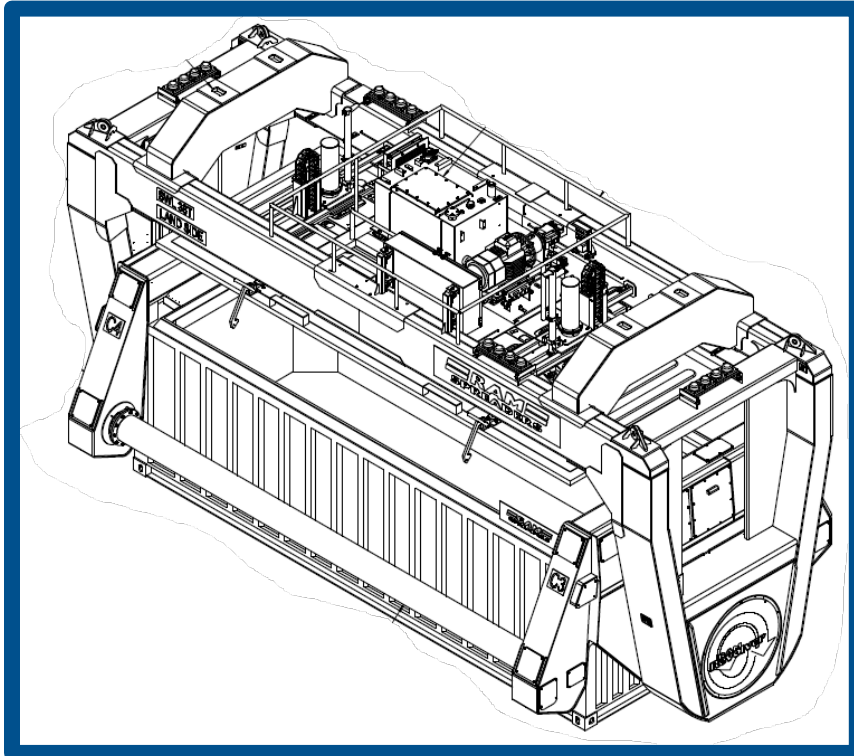
Soya | Rice

Ship Crane x1

MHC Crane x1

Barge to Ship





DP World San Antonio
San Antonio, Chile



Copper
STS Crane x2
Pit to Ship

TERMINAL PACÍFICO SUR VALPARAÍSO

Valparaíso, Chile



TPS
— VALPARAÍSO —

 **Ultram**
agencia marítima

Copper

STS Crane x1

Pit to Ship

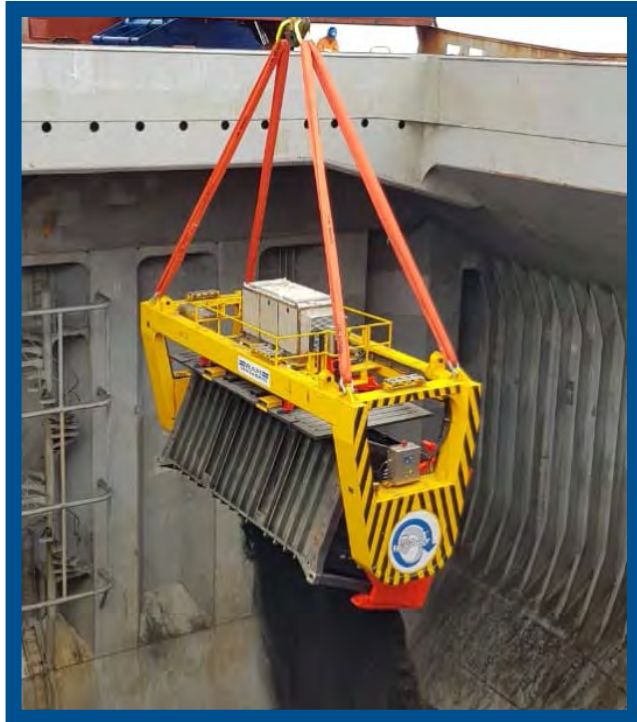
 **AngloAmerican**



CBH CLIENTS IN THE AMERICAS



Video: <https://vimeo.com/637403357>



TERMINAL PUERTO COQUIMBO
Coquimbo, Chile



Copper

Ship Crane, Reachstacker
(Light Weight) MHC Crane x1

MHC Crane x 1
Shed to Ship





CBH CLIENTS IN THE AMERICAS



ANTOFAGASTA INTERNATIONAL TERMINAL

Antofagasta, Chile

Video: <https://vimeo.com/289884717>



Zinc | Copper
MHC Crane x3
External Shed to Ship





Inter Sea
Antofagasta, Chile



INTER SEA LTDA.

Copper
Reachstacker x1
Pit to Shed
Blending

BHP

MINERA SPENCE S.A.

Video: <https://vimeo.com/551417941>



PUERTO MEJILLONES
Mejillones, Chile



Copper | Zinc
Bridge Crane x2
Pit to Ship-Loader



MINERA SPENCE S.A.



Video: <https://vimeo.com/258058898>



PUERTO ANGAMOS
Mejillones, Chile



Copper | Zinc | Potassium Salt

Teck | QB2

MHC Crane x4

Pit to Ship

◆ SUMITOMO METAL MINING

Shed to Ship

Pipe to Ship



Video: <https://vimeo.com/743350010>

Terminal Graneles del Norte
Mejillones, Chile



Copper
ARMG Crane x3
Pit to Ship-Loader Automated



IQUIQUE TERMINAL INTERNACIONAL

Iquique, Chile



Copper | Soya
MHC Crane x1
Pipe to Ship
Shed to Ship



TERMINAL PUERTO ARICA

Arica, Chile



Zinc

MHC Crane x2

Shed to Ship

GLENCORE





BOLIVIA - 1

CBH CLIENTS IN THE AMERICAS



Video: <https://vimeo.com/260940208/afd292bcd7>



GRAVETAL
Puerto Quijarro, Bolivia



Urea
Reach Stacker x1
Bi-Modal Pit to Shed



Video: <https://vimeo.com/742199560>



MMG LAS BAMBAS
Puerto Matarani, Peru



Copper
Bridge Crane x4
Reach Stacker
Ship Crane
Bi-Modal Pit to Shed



CBH CLIENTS IN THE AMERICAS



Video: <https://vimeo.com/173488522>

SALAVERRY TERMINAL INTERNACIONAL

Salaverry, Peru



Copper | Coal
MHC Crane x1
Shed to Ship



GOLD FIELDS



CBH CLIENTS IN THE AMERICAS



TRAFIGURA MINING - EMINCAR

Pinar del Río, Cuba



Zinc

MHC Crane x1

STS Crane

Pit to Ship



Video: <https://vimeo.com/570320520>



HUTCHISON PORTS Manzanillo, Mexico



Copper | Zinc | Lead - Impala
Iron pellet - ArcelorMittal
MHC Crane x4
External Shed to Ship



Video: <https://vimeo.com/260069228/4268a37fdc>



ACEROS DE SONORA
Guaymas, Mexico



ACEROS
DE SONORA



Copper
Reach Stacker x2
Ship Crane
Pit to Shed





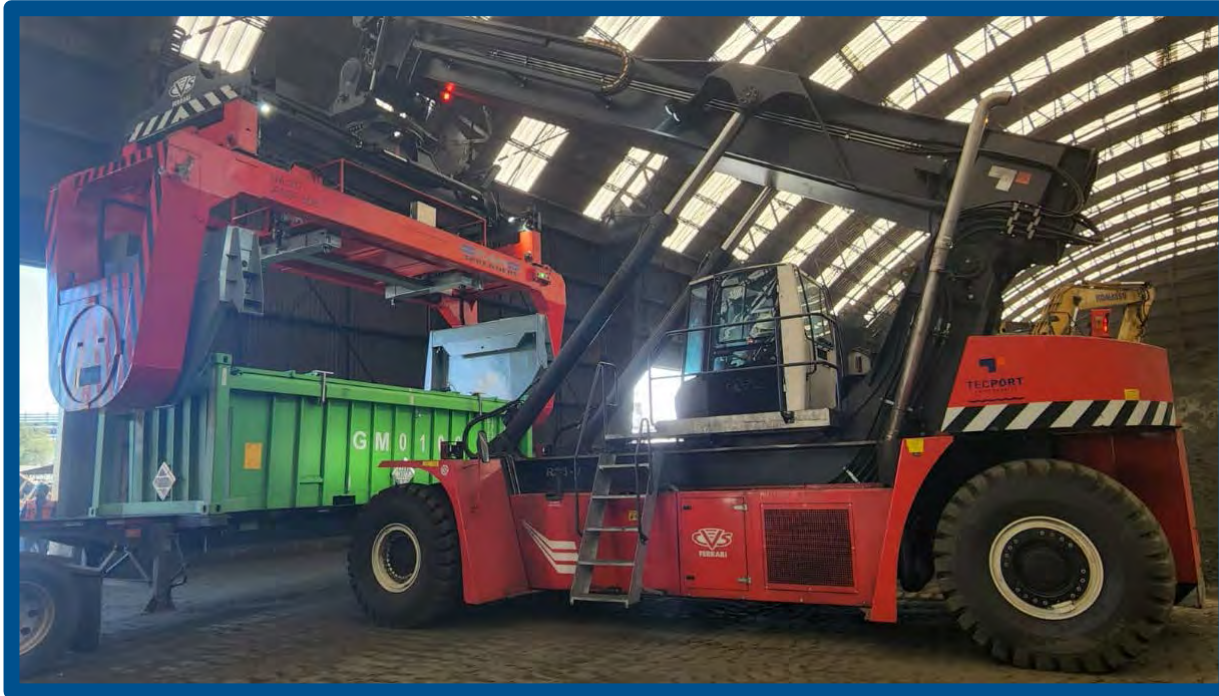
CBH CLIENTS IN THE AMERICAS



Grupo Mexico
Guaymas, Mexico



Copper
Reachstacker x1
Pit to Shed



UNITED STATES OF AMERICA - 1

CBH CLIENTS IN THE AMERICAS



SAVAGE

Elko Nevada, U.S.A.

SAVAGE

Pyrite Tailings

Reachstacker x1

Pit to Shed



Newmont™ **BARRICK**





CBH CLIENTS IN THE AMERICAS



SEARSPORT
Maine, USA



Wood Pellets | Wood Chips

MHC Crane x1
Shed to Ship



CBH CLIENTS IN THE AMERICAS



DP World Fraser Surrey & New Gold
Vancouver BC, Canada



Copper
STS Crane x3
Pit to Ship





CBH CLIENTS IN THE AMERICAS



Video: <https://vimeo.com/827272900/e848570a02?share=copy>



SOLURAIL
Val-d'Or QC, Canada



Spodumene (Lithium)
Reachstacker x1
Pit to Rail Gondola





CBH MINING CLIENTS IN THE AMERICAS



GLENCORE

impala



BHP



◆ SUMITOMO METAL MINING



newgold™

SAYONA



Newmont™

BARRICK

COMMODITIES HANDLED



International Bulk Journal Awards - 2014
Environmental Protection Award



International Bulk Journal Awards - 2016
Innovative Technology Award

