The learnings in placer washplant design inspired by miners

Dawson, May 21, 2022

Macon INDUSTRIES

Macon Industries – Who we are

Located on Vancouver Island, BC, Canada, Macon Industries is a worldwide supplier and creator of diamond core drilling and gold mining equipment.

Macon has been manufacturing placer mining equipment since 2012. Working alongside industry experts, we have designed a complete line of gold wash plants. With so many different types of ground and production levels, we assess and identify effective solutions for every scenario.

Matt, Chris and Ben who designed, built and commissioned the first washplants 10 years ago are still all managing the company today.





Helping experienced miners scale

- Macon sees its position in combining the understanding of the placer mining community with it's design and fabrication capabilities
- We have put our clients' ideas to reality and retain the best ideas to progress the design – we are constantly looking for input from miners
- Machine design time equals build time
  → Cost offset comes from continuously improved serial production
- We build trust by working with our clients through the bugs that come with every build even after multiple iterations



Throwback 2012 – Atlin T600 Trommels

Inspiration from Overseas (Gray Brothers Engineering, New Zealand, who we have an ongoing relationship with, sharing proprietary design information)

First machines built from partial paper drawings and napkin sketches

In general, these machines worked well but there were learnings …

- Punch plate screen panels were welded into the drum - big effort to replace worn panels
- Distribution onto the sluice run wasn't great - catch tray was just a finger design vs splitter box style
- Electrical panels were standard outdoor units vs Nema 4 rated panels







Trommel vs Shaker Deck

None better than the other
Some prefer trommels, some prefer shaker decks - Macon offers both options

Shaker decks are structurally adjusted for Placer: Reinforced framework, media & inlet chute for bigger rocks, adjusted deck slope, optional retention dams and high pressure spray bars for improved material breakup.

Shaker decks have become popular due to primary sluice run, providing additional sluice run surface area





Feed

Attached Pre-wash Hopper for Excavator or Conveyor Feed

No moving parts, tough and durable

Saturates the material before it reaches the screen;

Easy to contain any spillage from under the hopper;

Attached Pan Feeder for Excavator Feed

Original Adrian Hollis design - our development inspired by M2

Allowing for fast excavator cycle time, since operator can dump a full bucket vs partial bucket;

Ability for one excavator to feed multiple plants;

More consistent feed rate

Applications: No clay







Screen Deck Wear

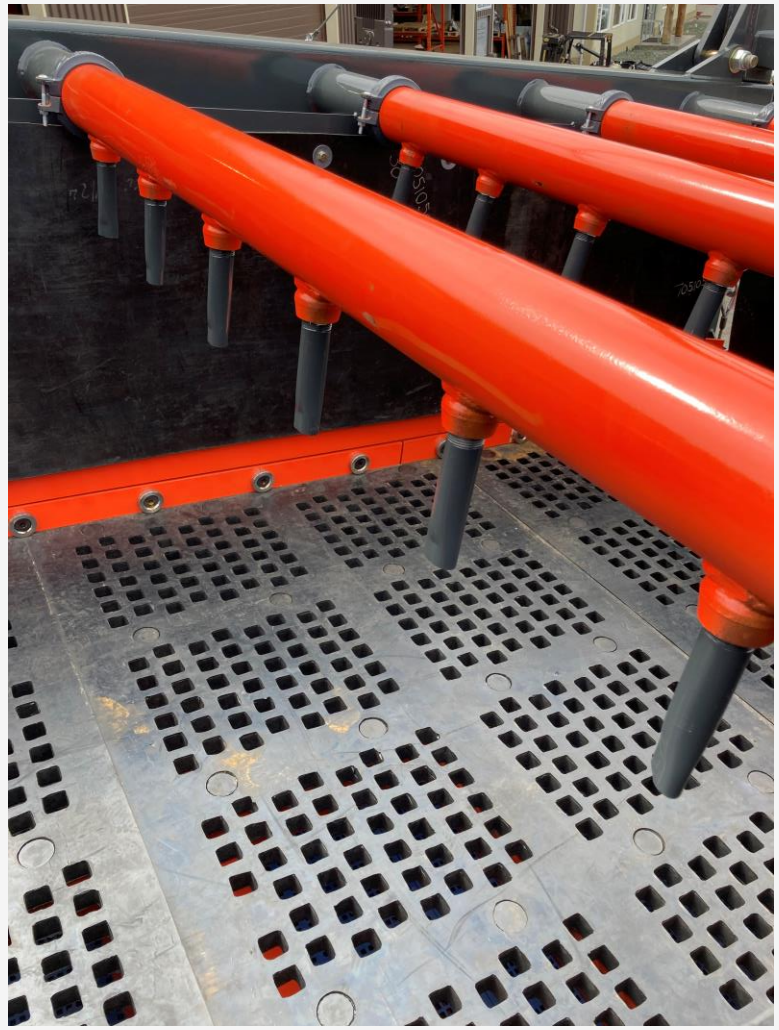
Trommel screen panels originally welded, now bolted

Shaker Deck top deck originally side tensioned, now bolted (since 2017)

- Top Deck made of steel punch plate or rubber lined (lasts longer, quieter)
- Side rails with bolt protectors



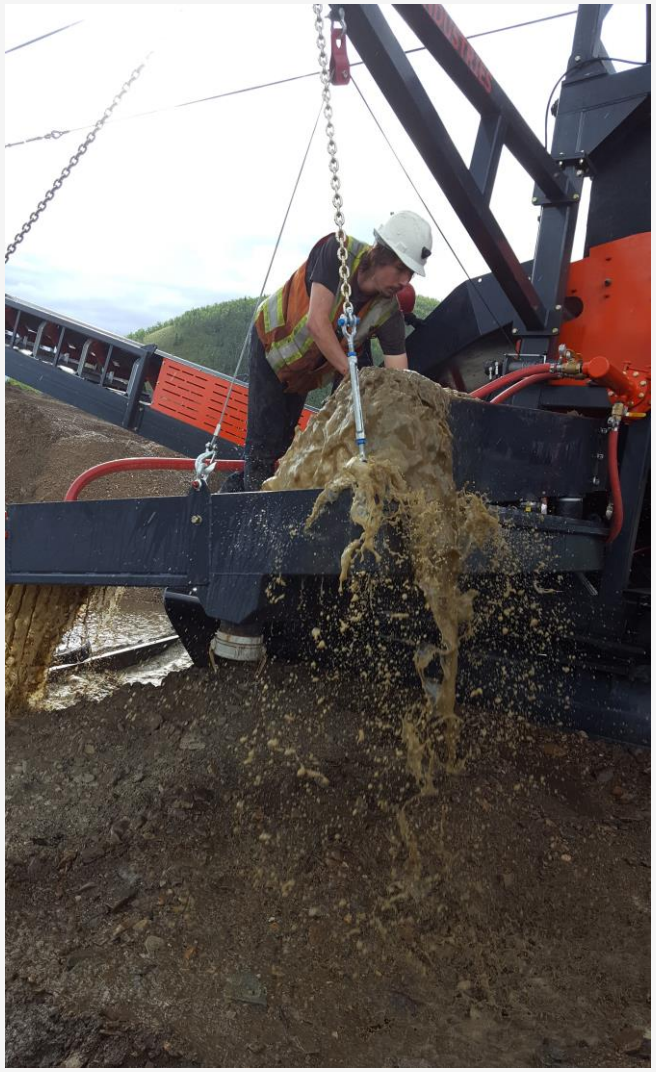




Slurry Distribution

Many learnings in the design

- Even slurry distribution from under trommel more difficult than screen deck due to rotation throwing slurry to one side
- Distributor dropping onto impact bed breaks velocity to lose the momentum before entering the sluice run
- Center distributor previously welded, now bolt in
- Rubber lining in distributors offered optionally



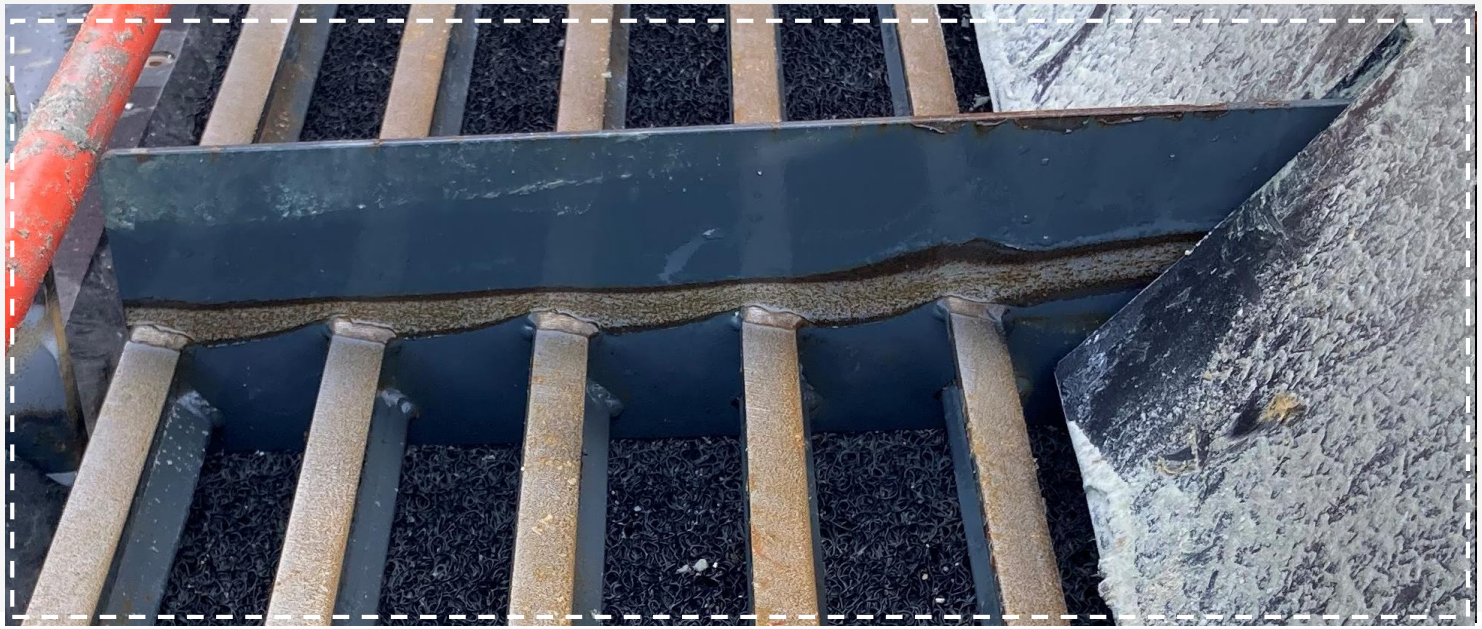


Hydraulic Riffles

Challenges with Hydraulic Riffles:

- Plugged holes or filters (manual basket strainer)
  Today's Self-cleaning Filter solves plugging issues

- Large concentrate volumes from deep hydraulic riffles
  T150 cleanup plant reduces concentrate volume to a manageable amount for tabling





Hydraulic Riffles in Primary Sluice Run

Principle:
Deep hydraulic riffles protect concentrate from erosion in high turbulence zone
Heavy hydraulic riffles can easily be lifted with chain hoist

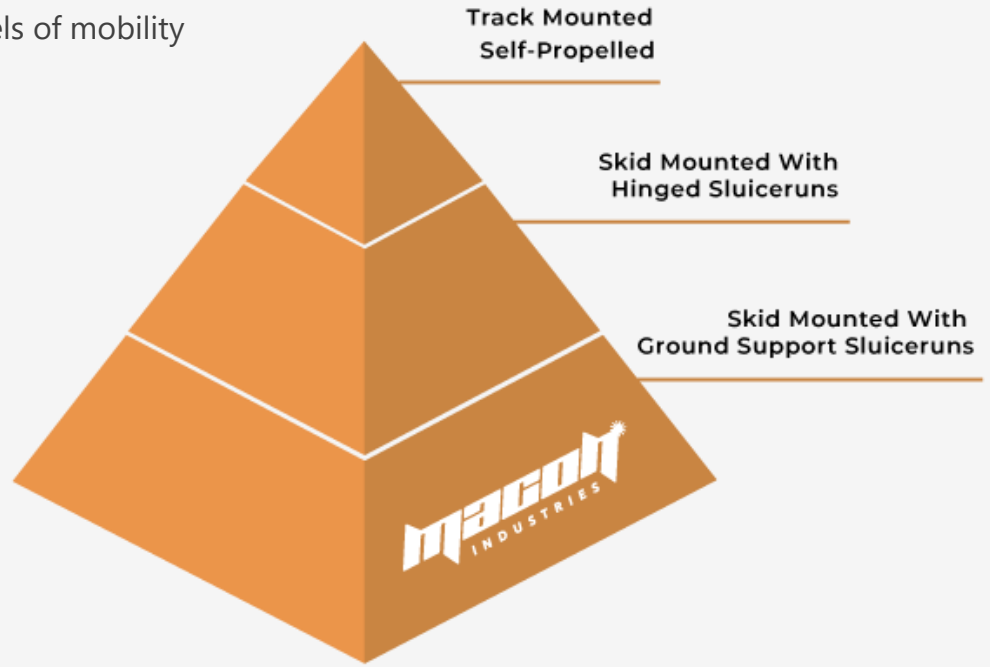
Development inspired by HC Mining - Increased recovery from 70% to 90% in the primary run
Now offered as an option with all SD series plants and retrofits to non-Macon washplants





Plant Mobility – Skids and Tracks

Levels of mobility







- Track mounted Trommel design inspired by M2
- Mobility concept lends itself to certain mining methods and comes with reclamation benefits

Plant Mobility – Levelling

- Fast and easy levelling increases mobility

Levelling to ground → Levelling to skid, but need to lower for towing (2016, inspired by Parker) → Levelling to skid, can be towed in raised position (2020, inspired by HC Mining)







Plant Mobility – Sluice Runs

- Sluice supports for increased mobility

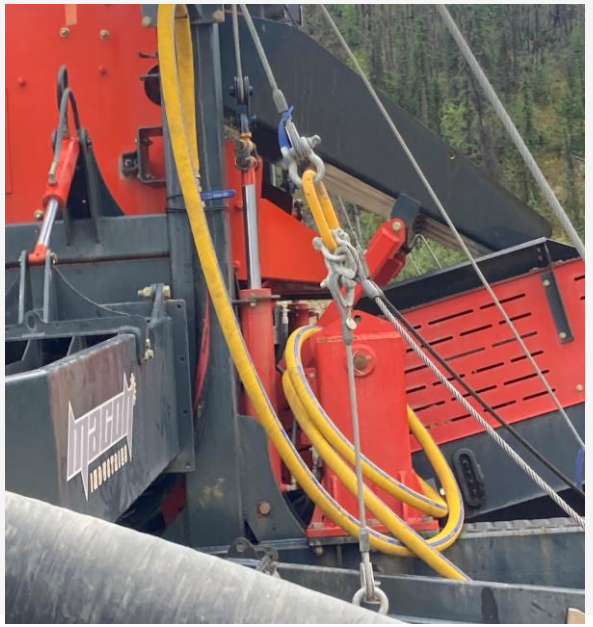
Ground supported, “stationary” sluice runs off one side

Hinged, forward facing sluice runs

Hinged, hydraulic cylinder operated supports







Sluice Run Cleanouts

- Features for fast and contained cleanouts

Boil Box Side Hatches



Hinged Primary Run with Concentrate Port



Folding Concentrate Troughs



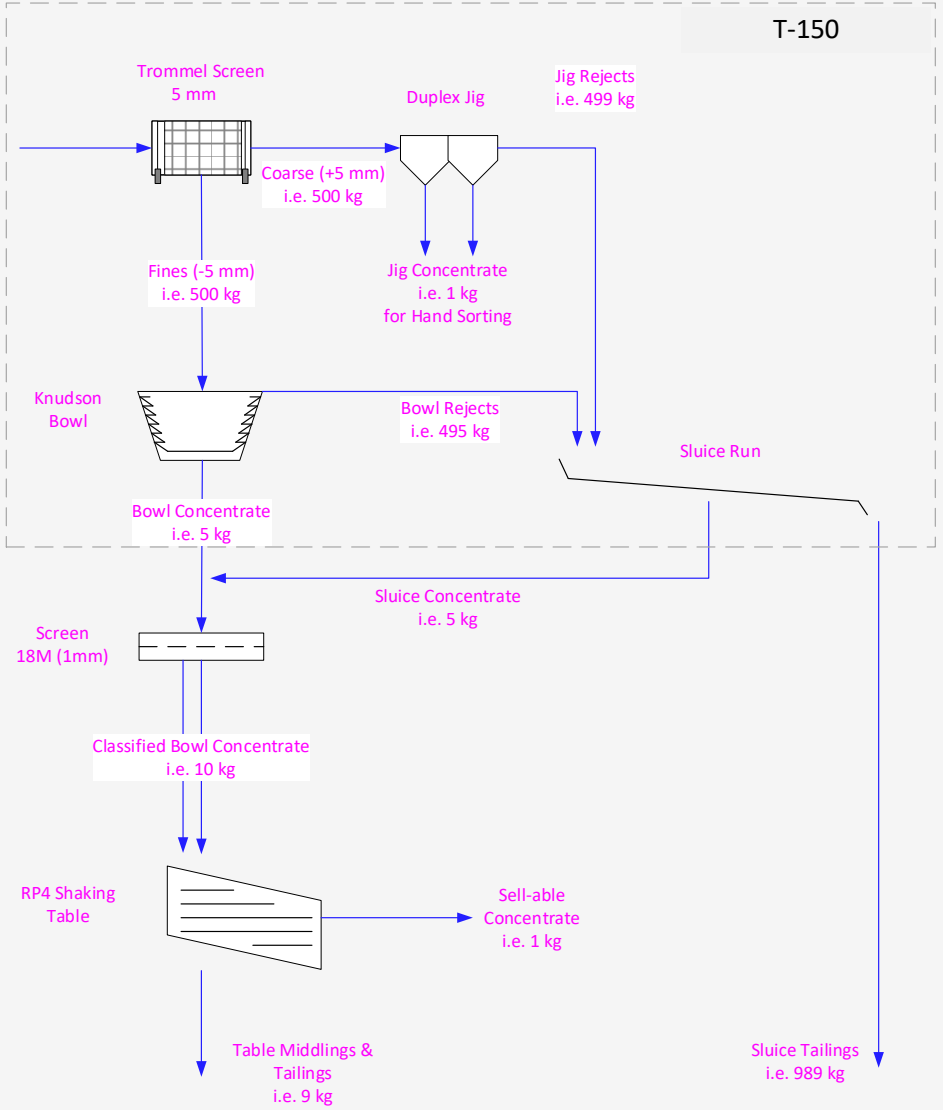
Concentrate Cleanup

- Sluice concentrate cleanup – often a slow and labor intensive process

  T150 Cleanup Plant: 2000lbs reduced to 10lbs in 45 min
  Concentrate from T150 is then cleaned by shaking table or gold wheel







Standardizing

Standardizing machines provides opportunity for crossover between parts

- Particular benefit for remote Yukon industry (Stuart Schmidt);
- Modular design to prioritize common off-the-shelf components
- From 2022 season, Macon will hold a 24/7 accessible parts inventory in Dawson:

  Common electric motors
  Screen Panels
  Drive belts
  Conveyor bearings
  Shaker Deck bearings
  Trommel drum rollers
  Nomad matting



Financing

Financing equipment has been a viable option for Canadian placer mining customers

- Certified OEM attracts more financing options
- Reduces cash tied up on capital purchases
- On-time delivery for custom-built equipment



Example:
80% of Purchase Price financed

Example:
Finance Term 48 months (up to 72 months)

Example:
10-20 weeks build time

Example:
1 week Trucking
2 days Assembly
3 days Commissioning

Thank you.

Jonas Boehnke – jonas@maconindustries.com
Jeff Turnell - jeff@maconindustries.com

