

# EnviroPozz Metakaolin

An environmentally friendly,  
high performance, naturally occurring  
supplementary cementitious material





## Whitemud Resources Inc.

Mineral leases  
>150,000,000 tonnes

Proven reserves  
>50,000,000 tonnes

175,000 tonnes per year  
patented Metakaolin  
processing facility



# Whitemud Resources Inc.

Bulk rail and truck loading facilities

Located southwest of Regina, Saskatchewan

# Metakaolin is a Supplementary Cementitious Material (SCM)

Whitemud's **EnviroPozz** metakaolin is processed from naturally occurring kaolin clay into a dry, off-white fine powder which meets the criteria for a Class "N" natural pozzolan in accordance with the CSA A-3000-08 and ASTM C618 standards.

**EnviroPozz** improves the quality, strength, resistance to chemical attack, durability and environmental footprint of concrete and other cementitious based products.

Cost effective when used alone in a mix or with Fly Ash, Slag or Silica Fume.

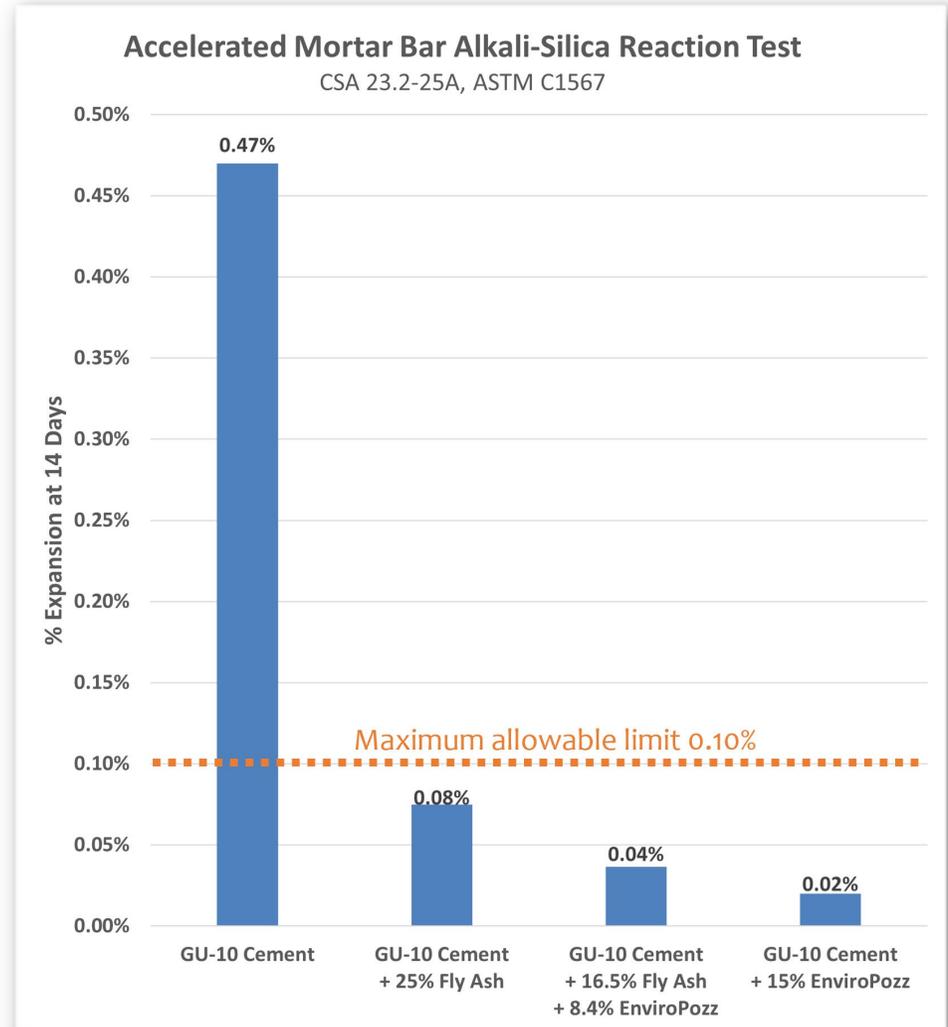


# EnviroPozz Improves Durability

Mixes created with **EnviroPozz** result in a reduced porosity and increased strength development, counteracting aggressive causes of concrete degradation which can occur under certain exposure conditions.

Concrete made with **EnviroPozz** meets the stringent requirements for:

- Chlorides (including C-XL, C-1)
- Sulfates (S-1 and S-2)
- Alkali-Silica Reaction mitigation (CSA 23.2 28A and ASTM C-1293)

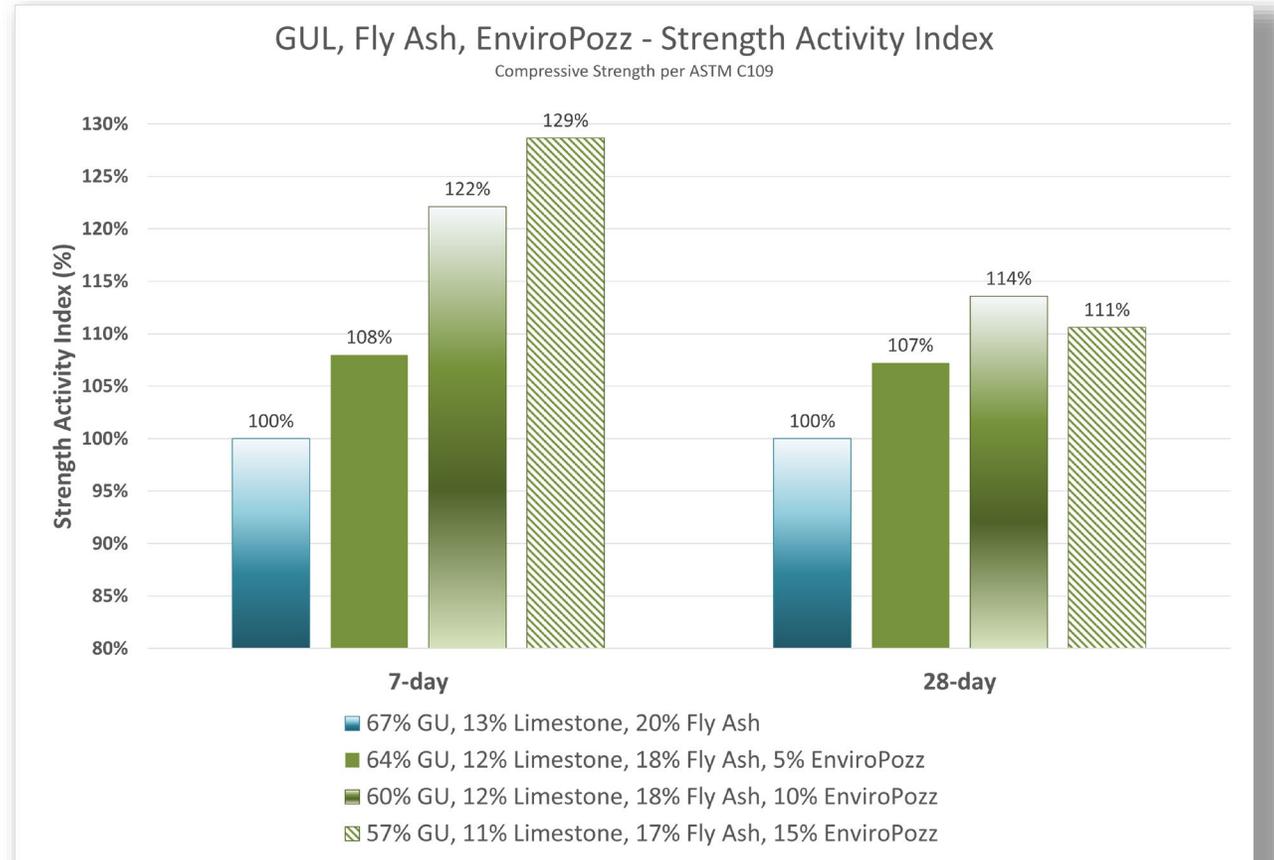


Source: Whitemud internal testing

# EnviroPozz Enhances Strength

Increases strength development at all stages of concrete curing (i.e. both early age and long-term improvements).

The versatility of **EnviroPozz** is a key performance factor. Strength benefits are found in mixes created with any type of cement, while being used as a stand alone SCM or combined with other SCMs.

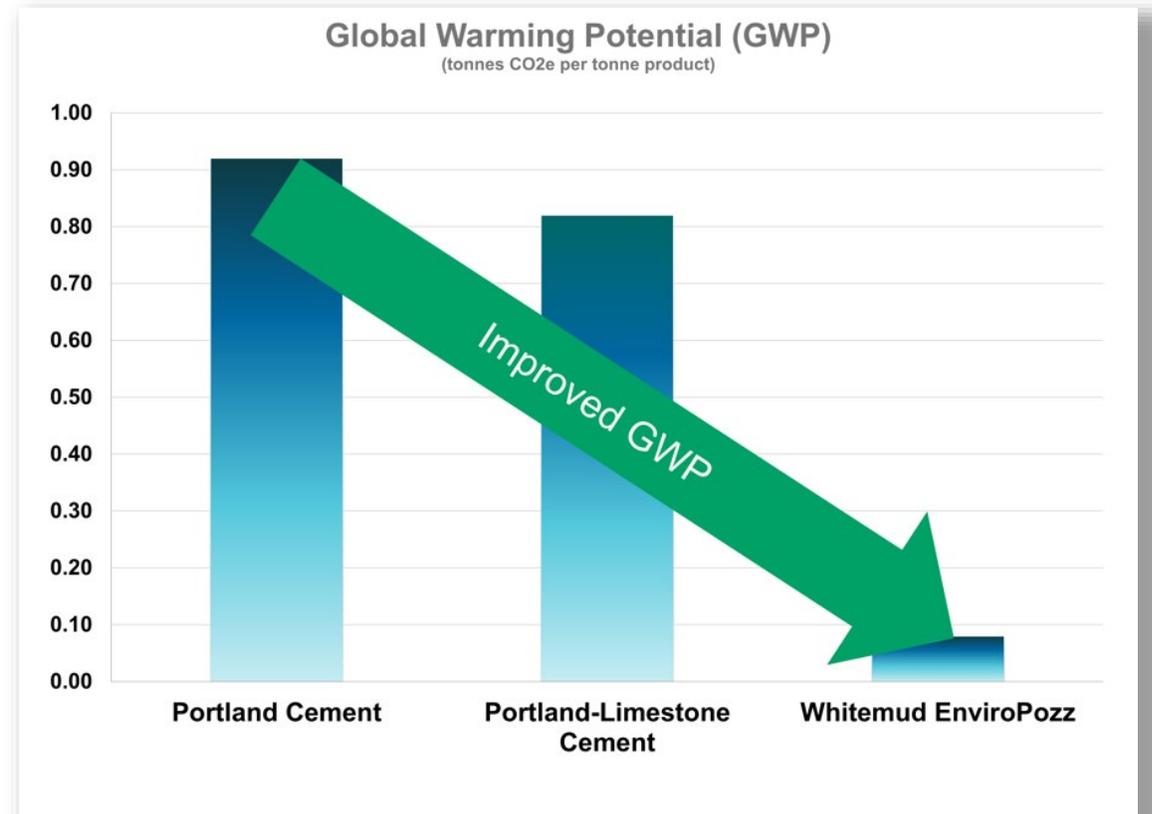


Source: Whitemud internal testing

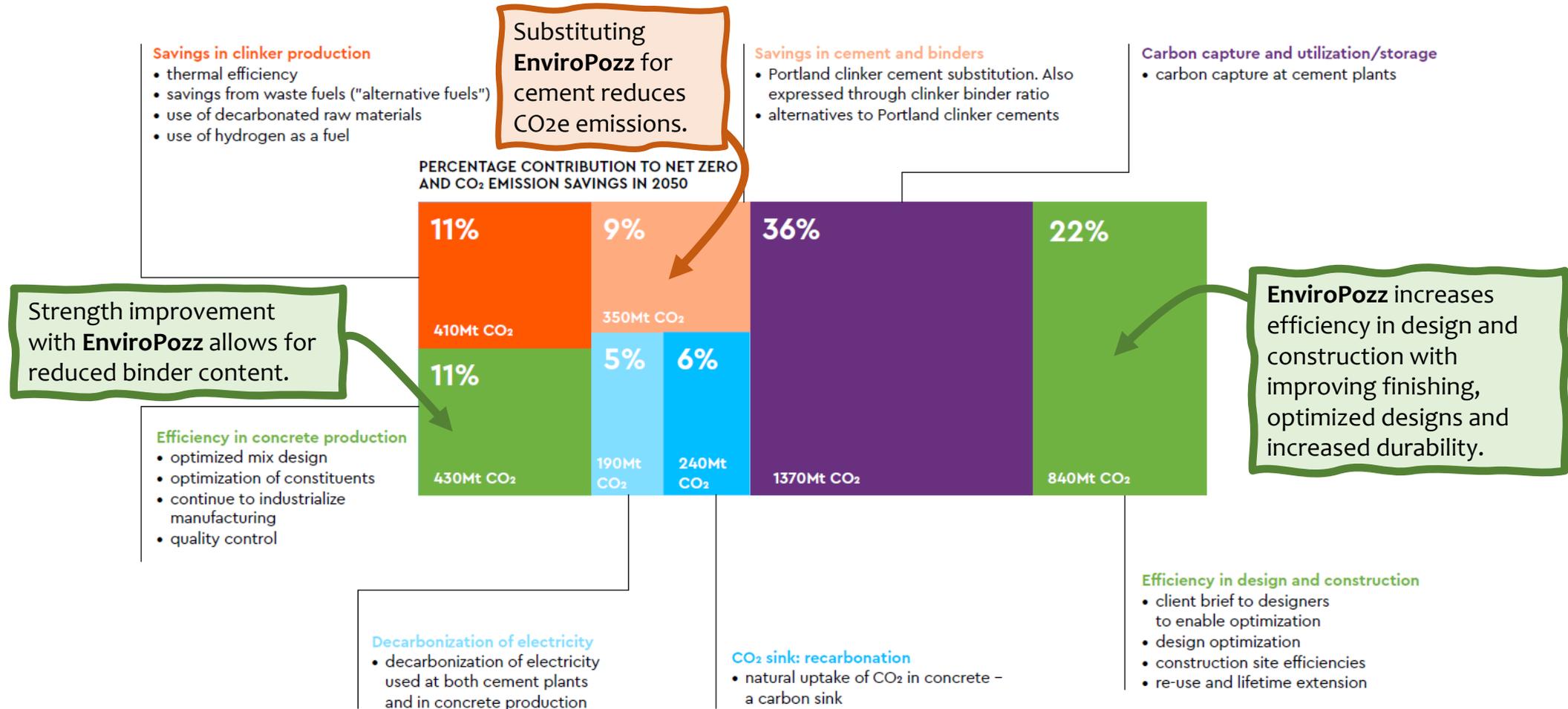
# EnviroPozz Reduces Cement's Environmental Footprint

Through the replacement of Portland and Portland-limestone cement, **EnviroPozz** lowers the carbon footprint of your concrete and cementitious blends.

- When manufactured with renewable fuels and electricity, **EnviroPozz's** Global Warming Potential (GWP) can be up to 90% less when compared to Portland cement.
- Due to its lighter colour, **EnviroPozz** reduces the heat island effect when used in pavements and other city infrastructure.
- **EnviroPozz** increases product durability, which can reduce project life cycle costs.



# EnviroPozz Contributes to a Net Zero Future

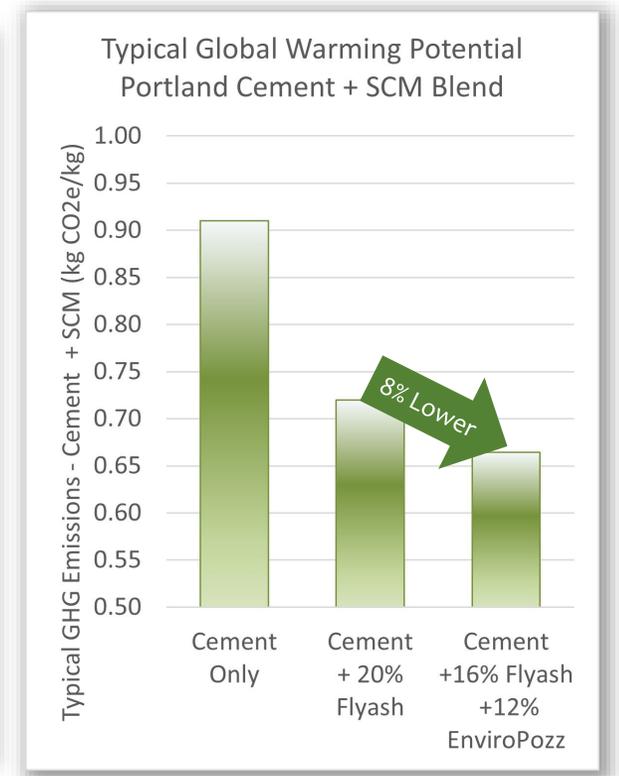
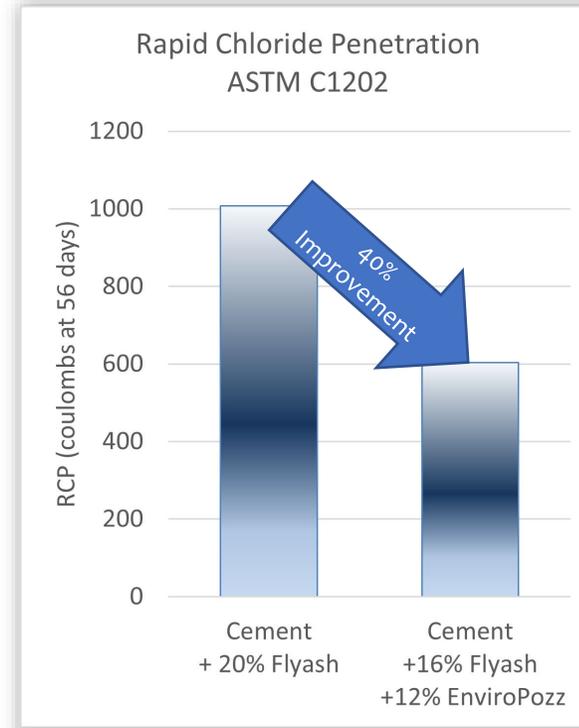


Source: Concrete Future – The GCCA 2050 Cement and Concrete Industry Roadmap for Net Zero Concrete

# EnviroPozz Enhances Performance of other SCMs

**EnviroPozz** enhances the performance of mix designs containing other SCM's (ie: fly ash) by delivering:

- increased durability
- mitigation properties including:
  - improved chloride resistance
  - reduced efflorescence
  - increased sulfate resistance
  - protection against ASR attack
- lower overall carbon footprint
- improved strength development which offsets slower setting times (fly ash specific)



Source: EBA Engineering & Whitemud internal testing

# Comparing EnviroPozz to Other SCMs

**Fly Ash:** Sources of quality fly ash are being rapidly reduced as coal fired power plants are phased out.

**Slag:** International imports are often relied upon in North America which are at risk of being interrupted.

**Silica Fume:** Very expensive and supply in North America is often limited.

Attribute	EnviroPozz	Fly Ash	Slag	Silica Fume
Early Strength	Excellent	Poor	Poor	Excellent
Long Term Strength	Excellent	Good	Good	Excellent
Permeability	Excellent	Good	Good	Excellent
Chlorides	Excellent	Good	Good	Excellent
Alkali Silica Reaction	Excellent	Excellent	Excellent	Good
Sulfates	Good	Excellent	Excellent	Good
Cost	Medium	Low	Low	Very High
Availability	Readily	Dwindling	Import Reliant	Limited

Source: Van Dam, T, "Supplementary Cementitious Materials and Blended Cements to Improve Sustainability of Concrete Pavements", National Concrete Paving Technical Center, 2013

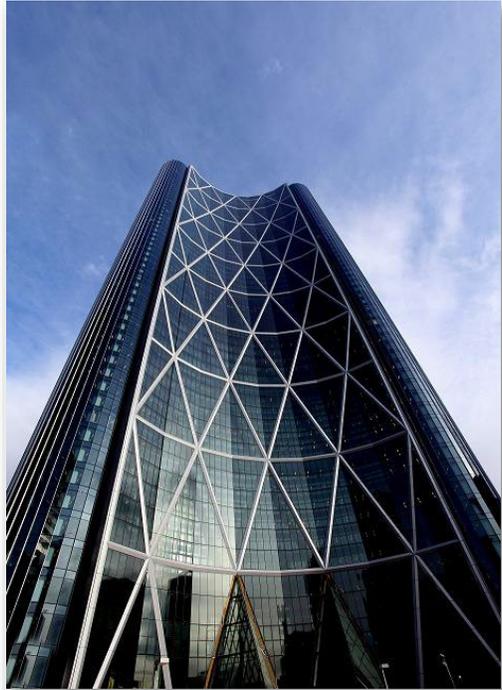
# Whitemud's EnviroPozz Metakaolin - Your Best Choice SCM

As an eco-friendly, made-in-Canada solution, with long-term security of supply and significant performance benefits in almost all cementitious applications, our **EnviroPozz** is your best choice SCM.

- Lower carbon footprint
- Security of supply
- Access by truck or rail
- Enhanced performance benefits
- Flexibility in applications
- Improved project life cycle costs



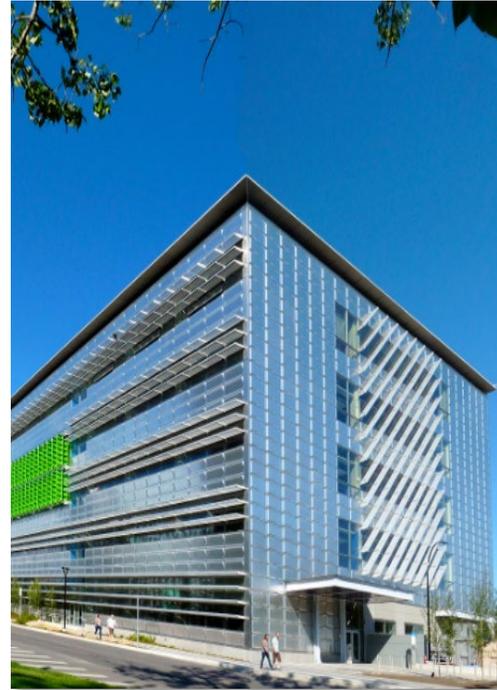
# Project Highlights



The Bow Calgary  
Improved pumpability,  
shrinkage resistance and  
strength properties allowed  
for significant project  
efficiency gains with  
**EnviroPozz.**



U of C - Taylor Family  
Digital Library  
Improved concrete qualities  
including consistency,  
placement and colour  
helped create a **greener  
building.**

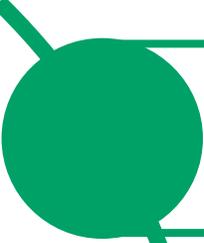


U of C EEEL Building  
Using **EnviroPozz** in its  
construction embodies  
everything the Energy  
Environment Experiential  
Learning building  
represents.

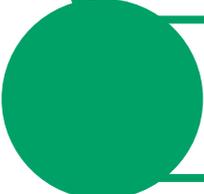


HWY 39 Bridge  
Overpass  
Meeting SK Highways  
specifications for high-  
performance concrete.

# Whitemud Metakaolin - Customer Testimonials



“We have been using Whitemud’s Metakaolin for seven years as a standard mix component in our ready mix concrete. ASR pop-outs was one of the primary reasons why we made the decision to batch all of our concrete with Whitemud’s Metakaolin. Since we started using MK, we have had zero reported instances of ASR pop-outs on our slab mixes. We have also come to appreciate the other positive attributes of MK including reduced shrinkage, improved workability and creaminess, and increased durability through a reduction in permeability. When crews first work with our MK mix, we frequently hear, “WOW! These guys really know how to make concrete!” MK in the mix produces a smoother product that rakes, floats and power trowels beautifully.” – Duracon Concrete Corp Owner



“I liked the Metakaolin concrete as soon as it came out of the truck. We were able to get our stripping strengths in 3 days, without accelerators. We can compress our construction schedule. Having Whitemud’s Metakaolin in the mix provides LEED points without adding work and time.” – EllisDon Senior Superintendent



“Using new products can sometimes be problematic however we had no issues integrating Whitemud’s Metakaolin into the project. The finishers found the mix to be really creamy and placing was no different to our normal mix. Coloration was more consistent on the form site of the slab. We would have no hesitation using this product on our next job.” – CANA Senior Project Manager



“The main challenges on the Bow Tower job were shrinkage and pump-ability. The flow-ability through the congested rebar required reducing the maximum aggregate size which increased the potential for shrinkage. Metakaolin in the mix has assisted in alleviating these issues. Our concrete mix design was able to satisfy the requirements for shrinkage and cracking. The pumping characteristics have met all requirements at the lower levels of the 58-floor structure. Metakaolin in our present mix designs has proven beneficial for LEED projects, early strengths, and stripping times.” – Inland Concrete QA/QC Lead

# Whitemud Resources Inc.

As a proven resource, with mineral leases supporting more than 200 years of production and a patented dry process, Whitemud Resources is committed to supporting the concrete and cementitious industries on building a brighter, **greener** future for generations to come.

Backed by strong corporate governance practices and supported by a proven technical team, Whitemud is here to provide the product, support and service that our clients expect and deserve.





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