Inland® TARP & LINER

PROJECT SPOTLIGHT

ARMORING OF MINE TAILINGS POND, ARIZONA

GEOMEMBRANE APPLICATION: Tailings Pond Containment

MATERIALS USED: ITL RCR-7, which is a Reinforced Concrete Roll (RCR) consisting of dry powdered concrete that is encapsulated between two non-woven geotextiles. One side of the RCR is a 6-ounce/sq yard Polypropylene (PP) non-woven geotextile. The other side of the RCR is a composite of a 6-ounce/sq yard non-woven PP geotextile and a 4.5 ounce/sq yard calendered non-woven PP geotextile that are needle-punched together. When rolled out and hydrated, the RCR becomes a durable structure suitable for reinforcement or a protective lining of dam at a fraction of the installation time, cost, and environmental footprint of conventional concrete slabs. RCRs can be installed in dry weather, rain, under water, and without traditional heavy concrete trucks, mixing, forms, or rebar. RCRs can be used for erosion control, irrigation canals, containment ponds, and liner armor protection as was the case in this project.

MEMBER COMPANY: Inland Tarp & Liner

Project Description

PROJECT DESCRIPTION

A reinforced concrete roll (RCR) or Geosynthetic Cementitious Composite Mat (GCCM) was installed safely, rapidly, and on budget at a mine site in beautiful Arizona. Over 120,000 ft² of RCR was used to protect/armor the freshwater side of a tailings pond berm. Water is an essential part of the mining process, and a failing buried liner system along the face of the berm was raising concern about contamination of the freshwater. Full saturation of the berm could lead to a slope failure as well. To combat potential slope failure and contamination, the RCR was placed on the pond berm to provide: (1) slope armoring, (2) a low permeability barrier, and (3) erosion protection from the ponded freshwater. The RCR had to be installed quickly because water levels in the freshwater pond could only be maintained at a low level for a short period of time. RCR is approved by the Mining Safety and Health Administration (MSHA) so it could be used on this mine site.

Lessons Learned

LESSONS LEARNED

Despite thorough pre-planning, large-scale construction sites can be challenged by surprise events, and this site was no exception. Initial challenges included a crane that was unable to be staged in the optimal position for installation of the RCR rolls. Though there was an acceptable secondary position (see **Figure 1**), the correct equipment was not immediately available to transition to the second position. Repositioning the crane, as well as identifying and locating additional equipment, all contributed to further delays that worked against a narrow RCR installation window.

Safety and time management was crucial to complete this installation project. High winds and inclement weather (including snow and excessive rainfall) were prevalent during November and December, which also contributed to the challenges of armoring this berm before winter. We count these challenges amongst our lessons learned when working on large-scale projects such as this one.

How Use of Fabrication Improved Project

HOW THE USE OF FABRICATION IMPROVED THIS PROJECT

Because an RCR is a relatively simple product with a less labor-intensive installation process than traditional concrete slabs, it requires minimal fabrication to transform the face of an earthen berm into an armored slope. In this application, unrolling the RCR from behind the berm (see **Figure 1**), utilizing an anchor trench at the top of the slope (see **Figure 2**), and overlapping each panel by six inches, meant the crew could seam the prefabricated panels of RCR using thermal fusion welding (see **Figure 3**). It was estimated that use of pre-fabricated RCRs saved weeks of labor and significant cost compared to other armoring methods considered. The steep slope angle (see **Figure 3**) made using RCR a feasible and effective solution for armoring the slope. **Figure 4** shows the finished berm slope with more than 120,000 ft^2 of RCR installed safely on the berm face.

Figure 1

Figure 2

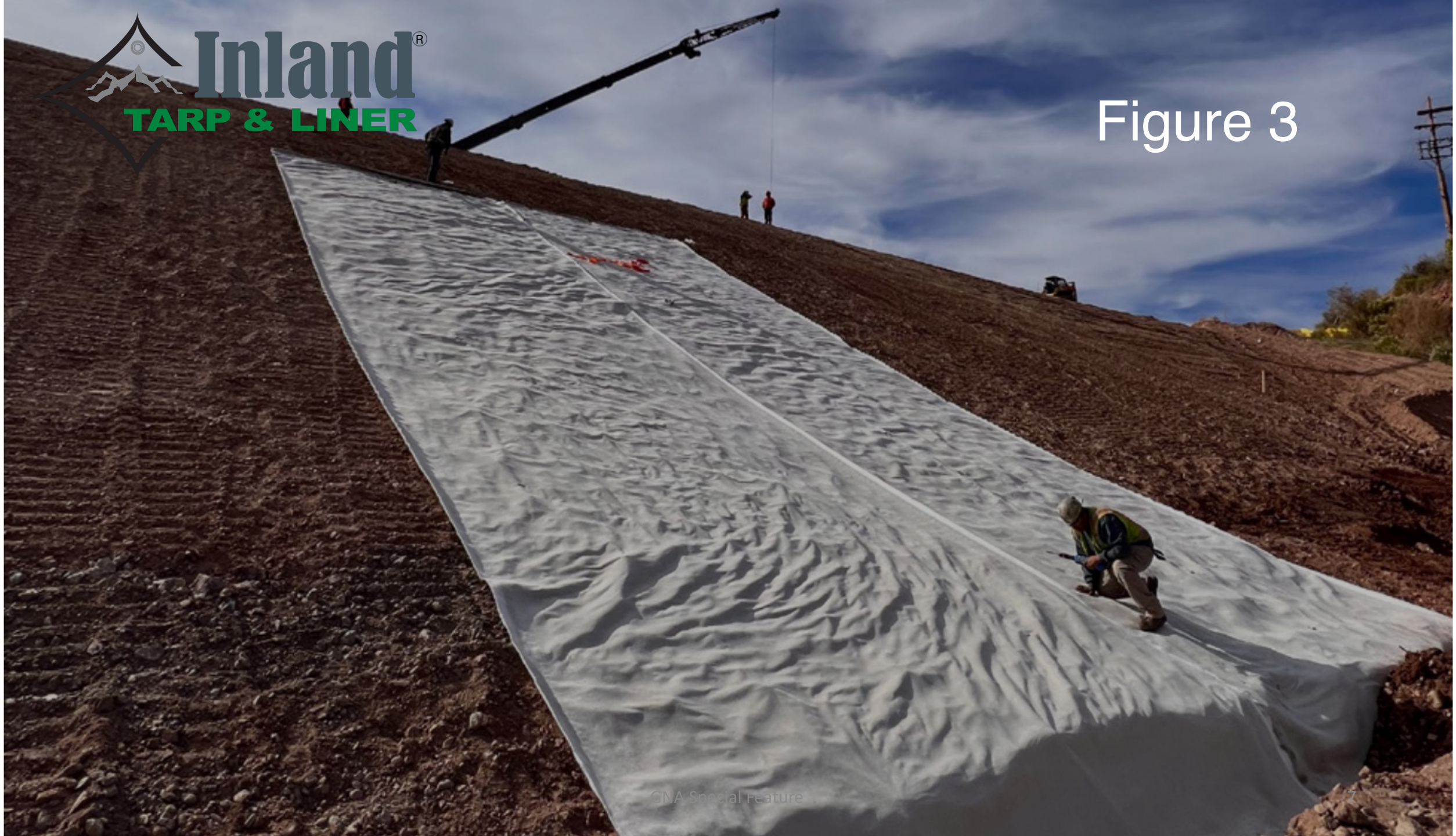

Figure 3

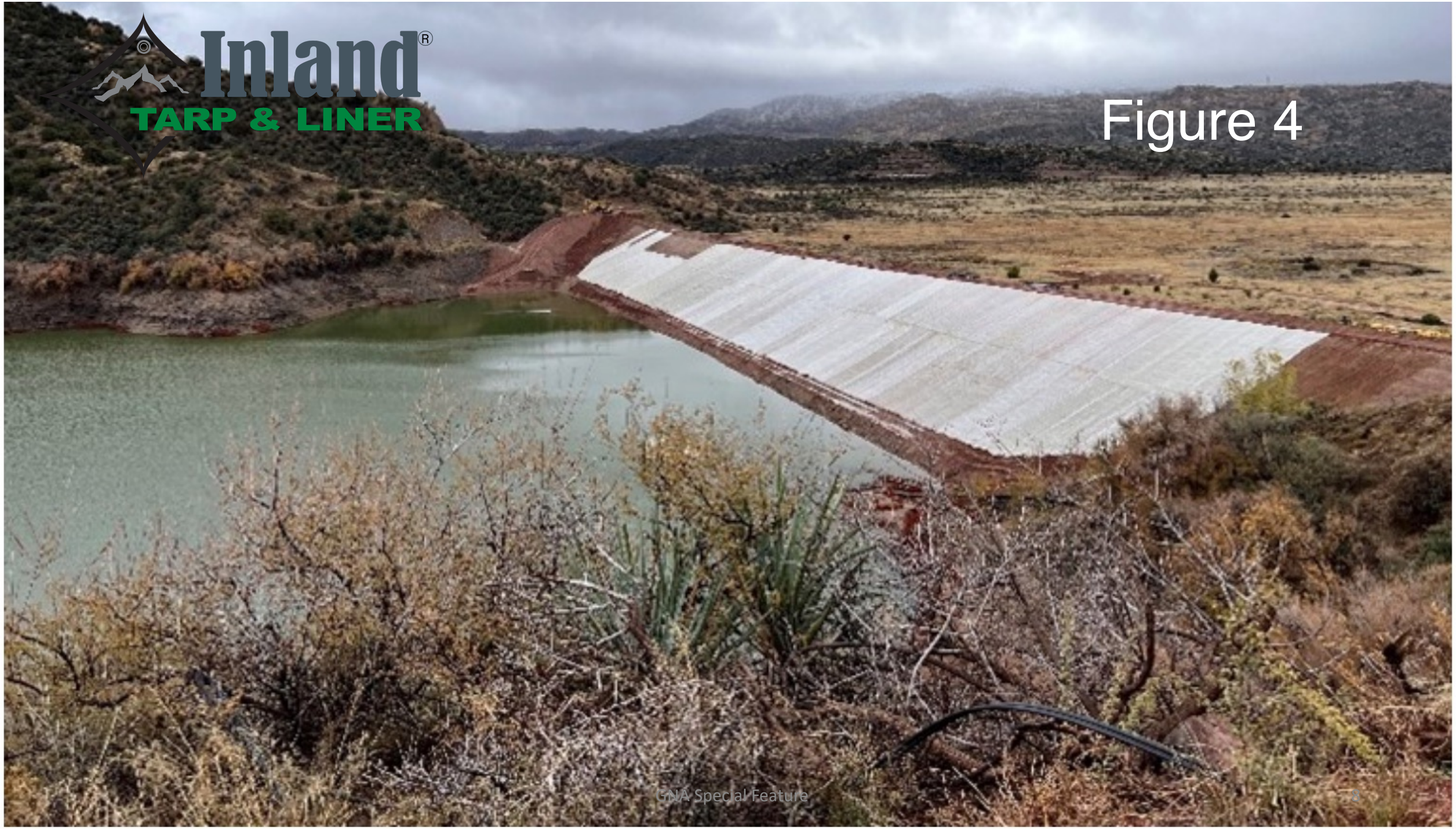
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Figure 4

FGI

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