

AUGUST 2021

Facts & Concerns Regarding Knife River Corporation Mine Operations

Woodward Property & Vanier Expansion

CROOK COUNTY
AUG 23 2021
PLANNING DEPT



CROOK COUNTY
COMMUNITY
DEVELOPMENT

Introduction

The Knife River Corporation is currently mining certain EFU zoned land for sand and gravel and then processing it on the Woodward property under a permitted process. The following report is a brief overview of the activities to be implemented and additional notes of problems that have arisen.

Woodward Open Mine

For Knife River to mine the sand and gravel, the process is as follows:

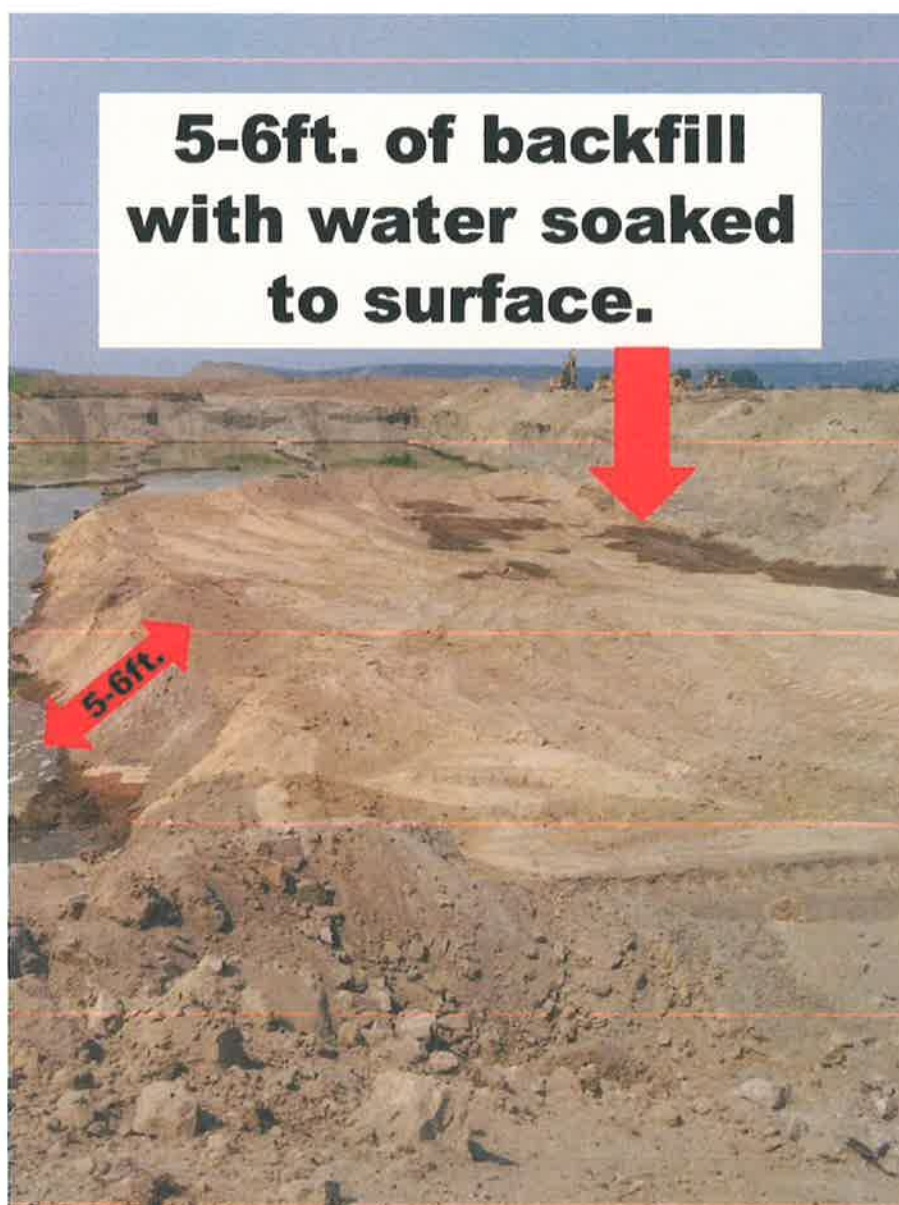
- 1) Approximately 2-3ft. of top soil is to be removed and stock piled separately.
- 2) 10-12ft. of overburden above the sand and gravel layer is to be removed and stock piled separately.
- 3) The sand and gravel layer is then removed and processed.

At this point, the total depth of the mine is in a range of 25-35ft. deep. The sand and gravel layer is water-bearing and has created significant problems in being able to mine materials. Attempts to manage the incoming water have failed. Portable pumps were placed in the bottom of the pit and water was transferred to the processing plant for use there. Excess water was pumped into a nearby drainage. It was discovered that this transfer and use of water violated OWRD laws and was not a permitted use.

Further attempts were made to build compacted backfill plugs (overburden which is compacted into an earthen dam) around the mine area to a depth of 35-40ft. in order to keep the water out of the area. Those attempts failed as well. Each day the mine filled with water and over a weekend would reach depths of 2-3ft. in the bottom of the mine. These activities occurred on the western portion of the Woodward property, which in comparison has considerably less water than the eastern portion next to the Vanier property.

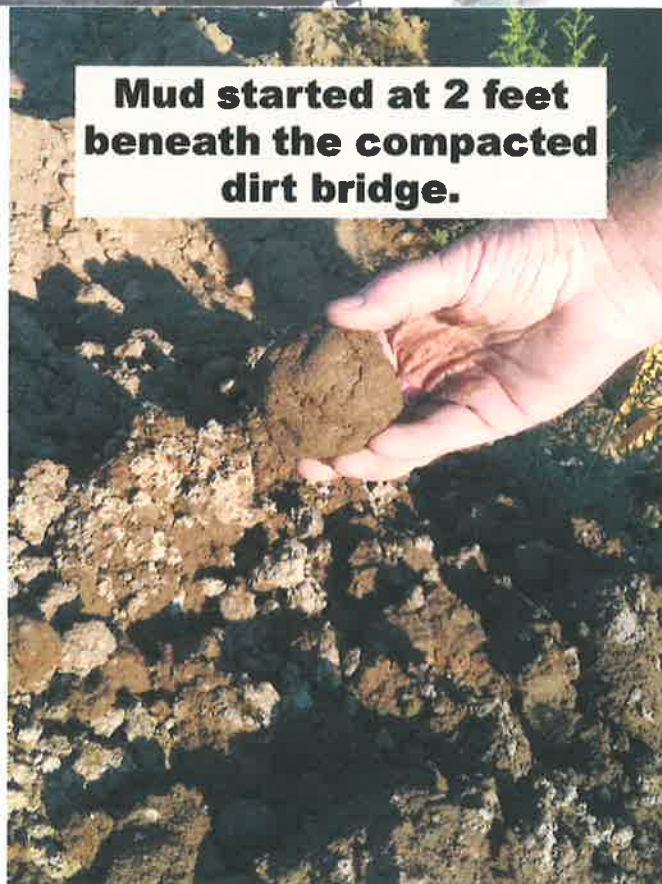
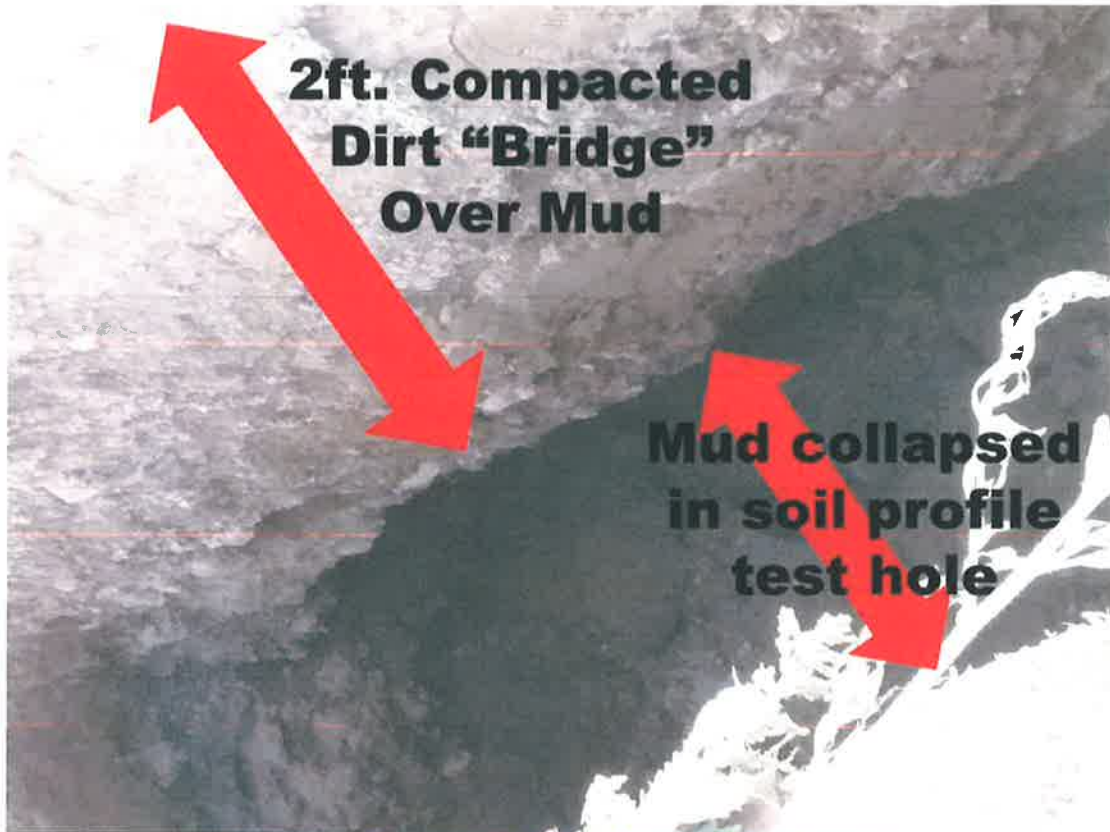
Woodward Land Reclamation/Restoration

Once the sand and gravel was removed, the overburden was dumped back into the hole about 5-6ft. in depth in an attempt to soak up water found inside the pit. The water immediately saturated the dirt and formed a muddy bog. Furthermore, equipment attempting to fill and level the area became stuck in the mud. To combat this development, additional dirt was dumped in layers 2-3ft. deep. Each layer was compacted with water and equipment hard enough to form a “bridge over the mud beneath it”. It is nothing but mud 2-3ft. below the surface.



Static water level is 14ft. below pre-mined field level





Currently, the “reclaimed” ground is not suitable to farm. The top soil, which was to be the top layer purposed for farming, was not placed back on top as a finished grade. Instead, much of the surface is as hard as concrete. Attempts to subsoil the ground to break up this hard top layer resulted in huge chunks of hard compacted dirt rolled up on the surface.



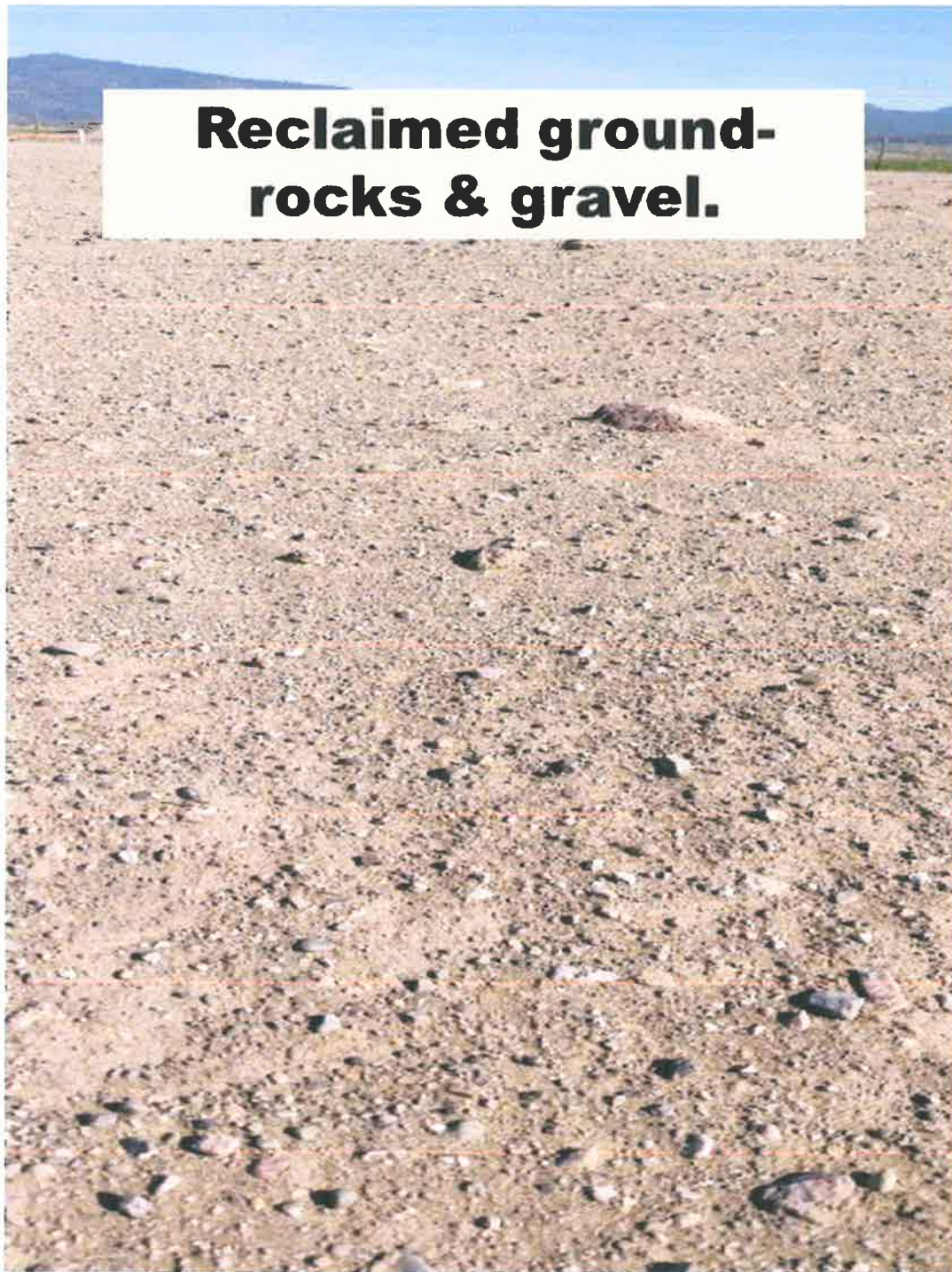
Example of “dirt chunks”, 18-24 inches wide and 4-6 inches thick. So hard did not break under pressure from D8 Cat.



Before subsoiling was done, the surface looked like a moonscape covered with rocks, coarse gravel, and blow sand- with absolutely no top soil in existence.

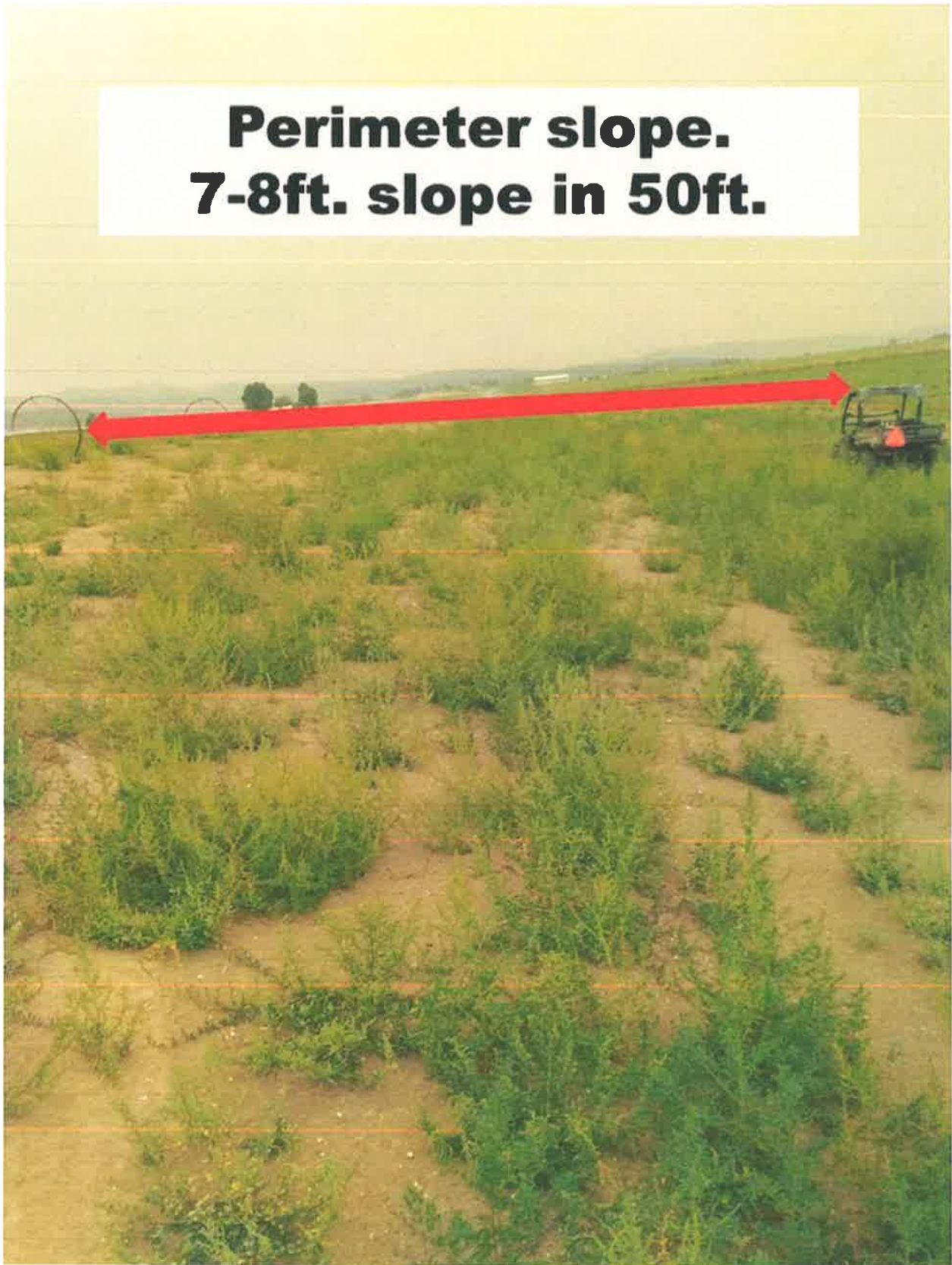
Reclaimed ground – rocks & gravel.





If subsoiling is finished over the entire mine site, the subsurface water will most likely wick upward to saturate the surface- turning the land into nothing more than a mud hole. The finished grade around the perimeter of the land is so steep that water will run off the slopes along the edge of the field and pond at the bottom of the slope.

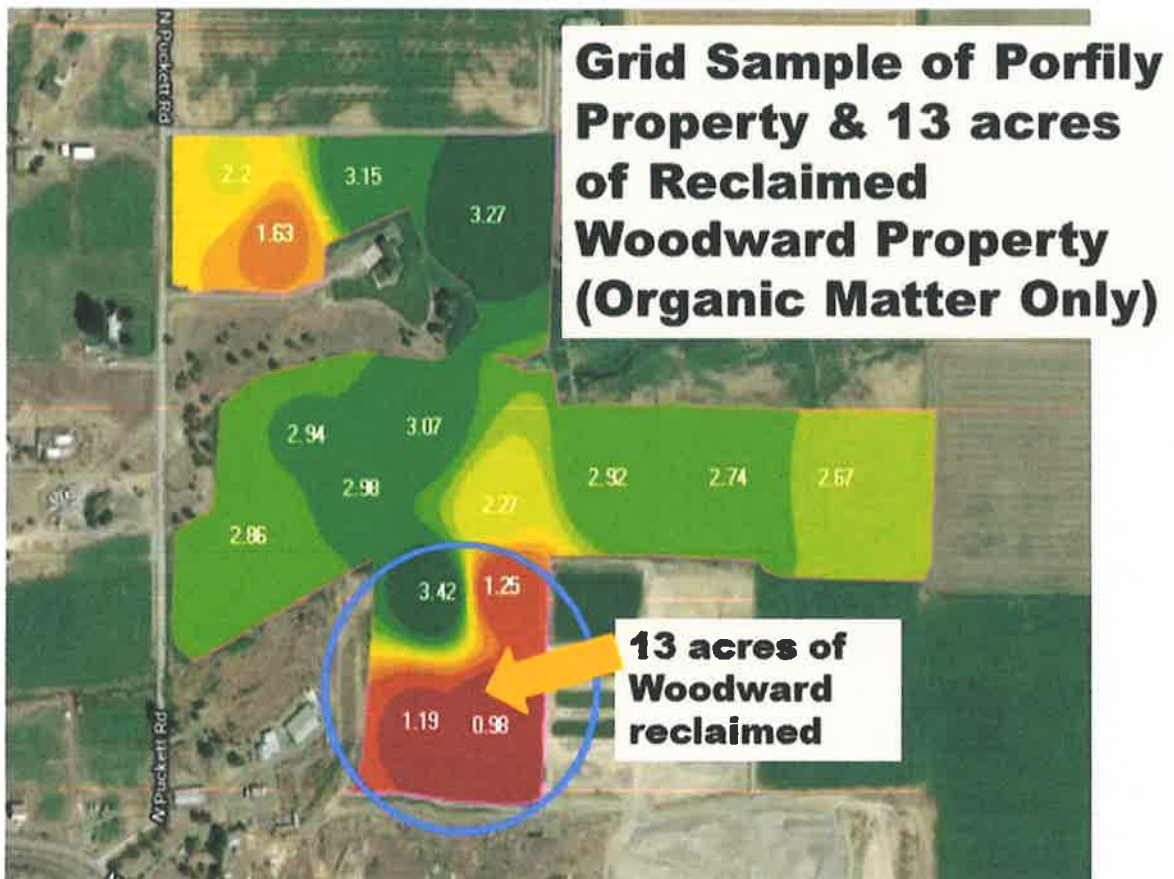
**Perimeter slope.
7-8ft. slope in 50ft.**



KNIFE RIVER MINING OPERATION

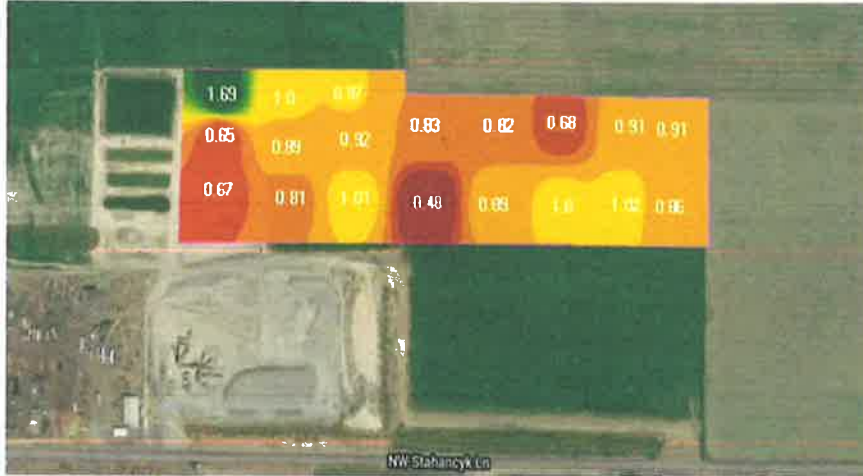
13 acres of reclaimed ground that is currently being farmed has severe compaction issues and water will not percolate through the soil profile. Nutrient levels are very low. Organic matter is non-existent. Yields on this ground are about 40-50% of non-mined ground. Subsoiling the ground is costly and time-consuming. Nutrient restoration will cost thousands per acre. However, Knife River has stated that their only obligation under the permit is to return the land to “some degree of level” and nothing more.

Depth	UOM	Top(Inch)	Bottom(Inch)	Min.	Max.	Avg.
D1	%	0	9	0.98	3.42	2.47

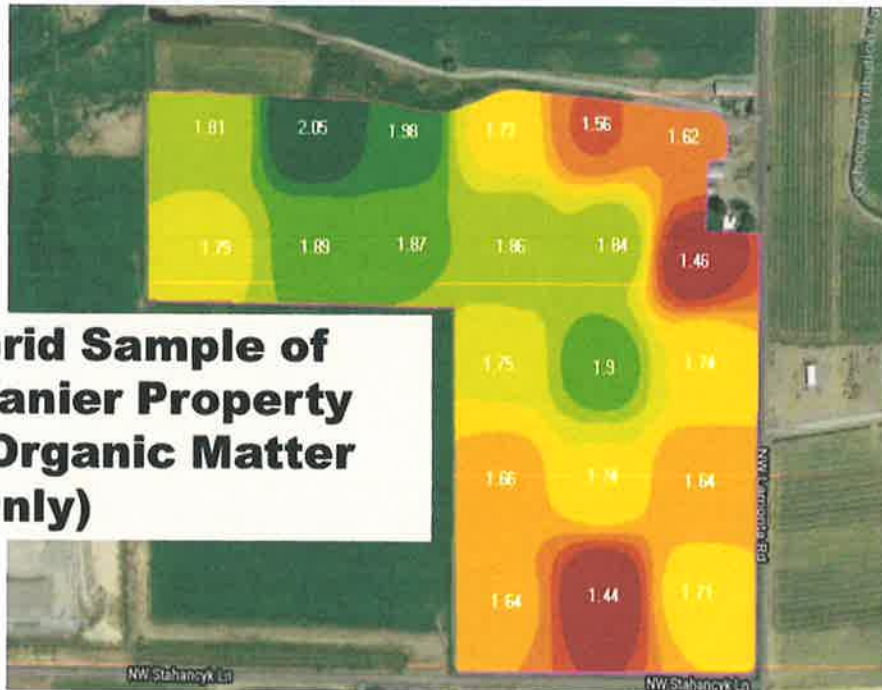


Depth	UOM	Top(inch)	Bottom(inch)	Min.	Max.	Avg.
D1	%	0	9	0.48	1.69	0.9

Grid Sample 30 acres of Woodward Reclaimed Land (Organic Matter Results Only)



Depth	UOM	Top(inch)	Bottom(inch)	Min.	Max.	Avg.
D1	%	0	9	1.44	2.05	1.75



Grid Sample of Vanier Property (Organic Matter Only)

The charts above reflect only the organic matter. All properties were grid sampled for organic matter, Ph, and all major and minor elements. Cost analysis was done to bring fertility levels back to produce economically viable crops. Soil sampling was done by a soils lab in the region, familiar with local soil profiles.

Ground Water Complications

Ground water is a major issue. The sand and gravel layer provides an aquifer system to more than 50 wells in the area. Since the sand and gravel layer has been removed and replaced by huge backfill plugs, the water has no way to move through the soil profile. Instead, the water is soaked up by the backfill plugs. There are thousands of gallons per minute flowing through the system and there will most likely need to be a drain tile system installed to replace the sand and gravel layer so that the water can move through the soil profile. This system would run additional costs in the thousands of dollars per acre.

A well immediately adjacent to Knife River was test pumped recently. The results showed the SWL at 23ft. and was pumped at 330gpm- being the maximum capacity of the test pump. Knife River's hydrogeologist suggests that there is very little water in this aquifer.



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The evidence, however, suggests that is not accurate. Most recently a 5-7 acre open pit filled with 3-4ft. of water in approximately 30 hours. With calculating the inflow, this evidence would suggest at least 4,000-5,000gpm.



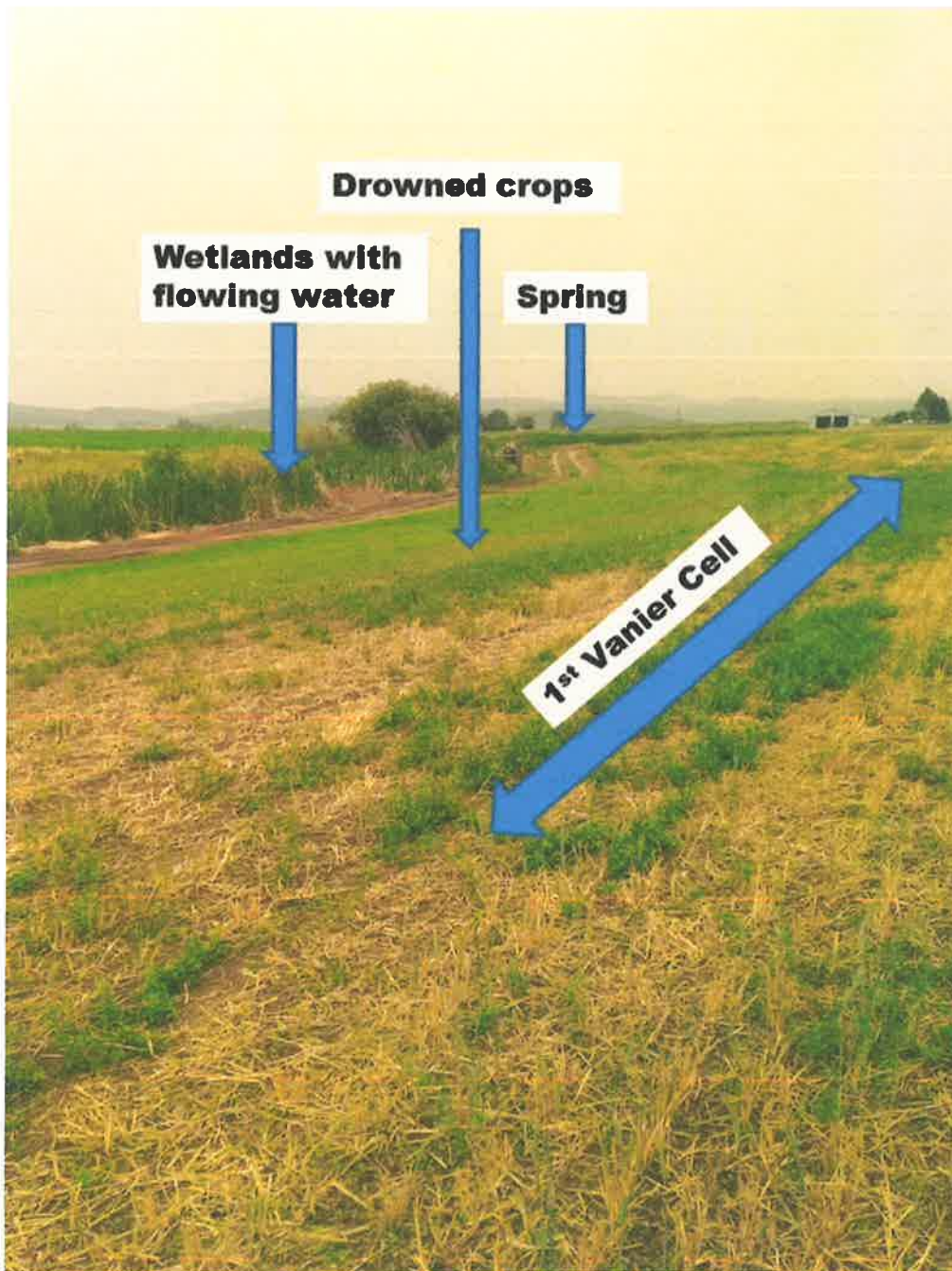
Knife River Expansion – Vanier Property

An expansion of the Knife River operation only multiplies the problems of the Woodward operation, but at a much greater level. At the Vanier property, the overburden is much thicker, the sand and gravel layer is deeper, and the water table and aquifer is of substantially greater volume. Core samples show there is water at 10-12ft. below ground level. Therefore, a mine at 35-40ft. deep will assuredly become inundated by water. Furthermore, the

KNIFE RIVER MINING OPERATION

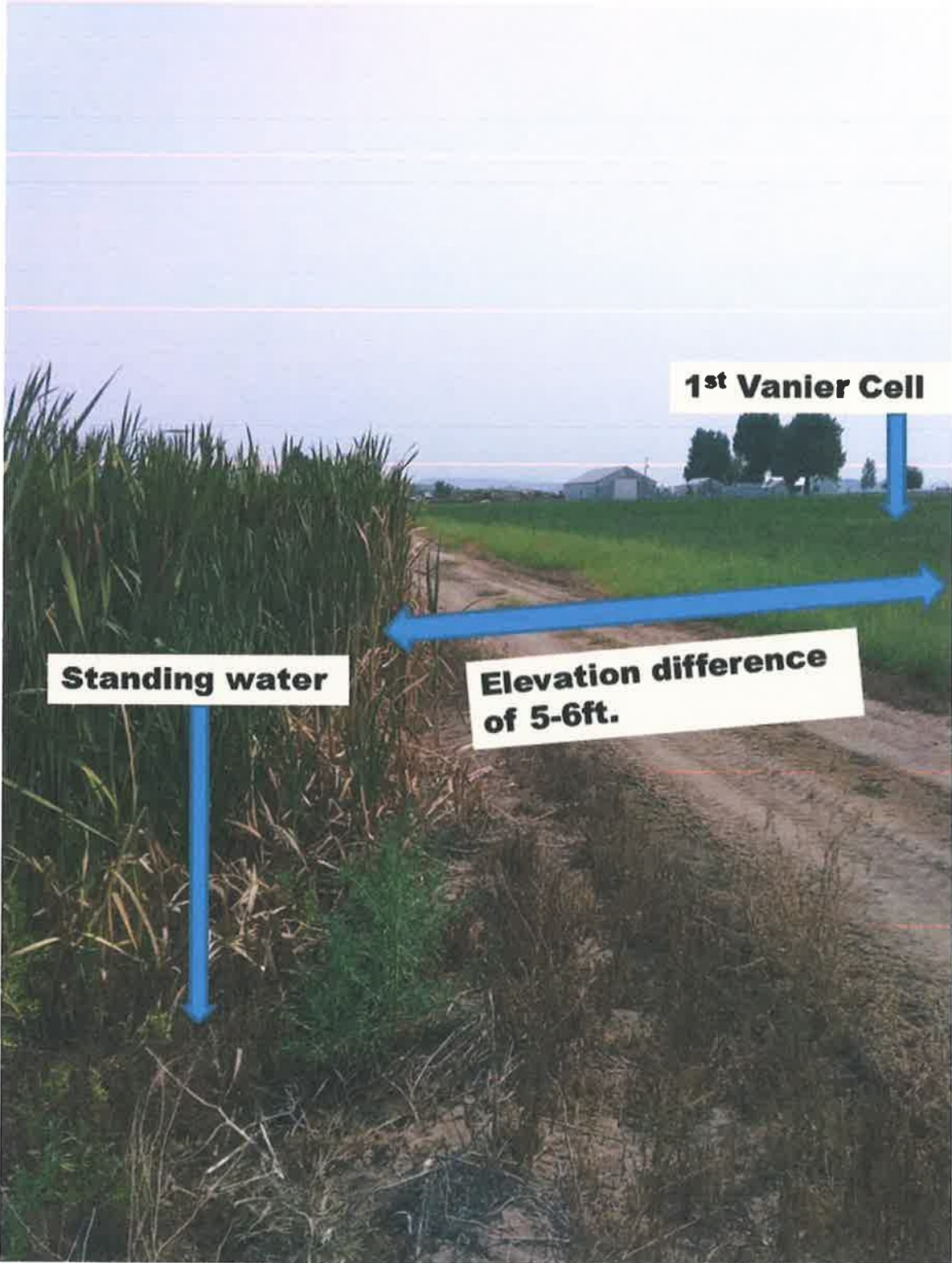
sand and gravel layer is mostly fine sand and some rock. Knife River has already stated that they have a 3-year supply of sand stock piled.

Within 50 yards of the proposed Vanier “first cell”, there is flowing ground water from a spring. Within 100 yards of that same cell, there is water so shallow that it is drowning out the crops.



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The proposed reclaimed level of the farm land is 8-10ft. lower than the present level- which places the new level below the water table.



KNIFE RIVER MINING OPERATION

The drainage adjacent to both these properties flows over 1,000gpm year round from springs in this aquifer. The water table and aquifer will be permanently changed. If the sand and gravel is removed, the water will build up behind the backfill plugs placed back in the pit, which will inevitably become saturated completely to the surface, leaving nothing more than a giant mud bog- which is not suitable farming land. The proposed recharge trenches will most likely fill up with water and overflow as the aquifer will not absorb the volume of water being delivered to it. The current aquifer layer is mostly fine sand with a small amount of gravel, which restricts the rate of water flow that will move through the sand.

The proposed plan has setbacks- berms and buildings which will consume approximately 30 acres of the 77 acre parcel, leaves approximately 40 acres that could actually be mined. Materials to make the berms will be taken from farm land top soil. Representations have been made that Knife River will only mine 5 acres at any one time, leaving the balance to be farmed. Knife River's definition of 5 acres is "only the area they are removing sand and gravel from". Now one must consider that in order to mine 5 acres, Knife River must use another 30-35 acres for stock piling materials, drying areas for settling pond sludge, haul roads, trenches, and more. Therefore, with all the setbacks and other activities, nearly all of the 77 acres will be consumed in some form of use by Knife River operations at all times.

With this expansion, all farming practices will be stopped and there will be an open dust bowl for years to come, impacting those who live in the area; until finally the soil is placed back in the mine pit. Then afterwards, the land will most likely turn into a mud bog; entirely non-farmable land.

Final Thoughts

The operations of Knife River have caused many other questions to arise:

- 1) What effect will the thousands of yards of construction waste Knife River buried in the mine have on the water quality?
- 2) Was it a permitted use to allow the site to be used as a landfill for such waste?
- 3) Who is going to bear the cost of the restoration of the land to EFU status?
- 4) Are we going to have another “Erin Brockovich” moment in 5-10 years?

Knife River has made it clear that they are miners, not farmers. They have demonstrated that they only have one objective- get the sand and gravel, level the site to some degree of level, and the rest is up to someone else. “We are here to make money, not spend it on making farm land- that is someone else’s problem”.

Eventually, the Knife River Corporation management and executives will be long gone; and there will be no remedy left for the local community or its land owners. Knife River has even stated that it would have to be determined who is at fault if any problems occurred. This would require massive litigation, which is just a cost of doing business with Knife River.

Who will stand up for our community and enforce the rules- making sure Knife River is held accountable?

Most likely, no one will.

To whom it may concern,



CROOK COUNTY
AUG 24 2021
PLANNING DEPT

My name is Richard L. Zimmerlee. I am an international agri-business consultant (retired)- and I submitted the document titled *Facts & Concerns Regarding Knife River Corporation Mine Operations*. It was received and time-stamped by the Crook County Planning Department on August 23rd 2021 and listed as exhibit 21.