

# Joffre Area Soil Enhancement Program

## How You Can Participate

Spring 2021

### Local Landowners Can Benefit from Low-Charge Program

NOVA Chemicals determined more than two decades ago that the lime / Phosphorus Removal System (PRS) by-product resulting from our use of water drawn from the Red Deer River has agricultural benefits. Working with local landowners, NOVA Chemicals, together with an agrology expert, continues to use this beneficial by-product to treat area lands. The by-product enhances soil properties of locally acidic soils and its use keeps it out of area landfills.

If you are a landowner within an approximate 90-kilometre radius of the Joffre Site, please contact us if you are interested in becoming a participant in the program. Your request will result in your lands being sampled by professional agrologists. They will assess your land's requirement for the beneficial application of the spent lime / phosphate by-product.

**Starting in 2021, the majority of costs associated with sampling, handling and spreading of the spent lime / phosphate by-product will be covered by NOVA Chemicals with a small portion of the costs being shared by the landowner.**



*The spent lime / phosphate by-product enhances soil properties of locally acidic soils. The current method of application is spreading of the dry by-product.*

**The application of spent lime / phosphate by-product to agricultural lands is regulated and approved by Alberta Environment.**

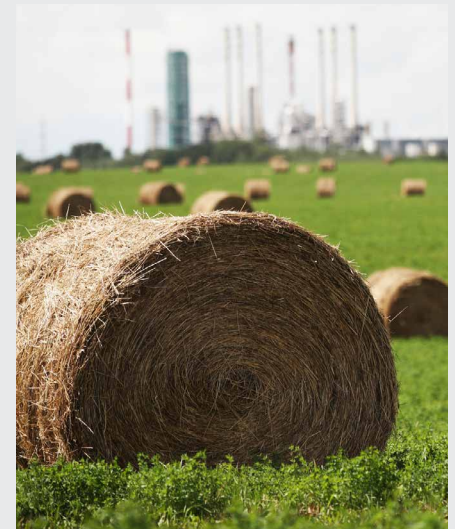
### Nutrient Uptake in Acidic Versus Neutral Soils

As an agricultural producer, you strive to ensure that soil nutrient levels can provide your crops as much nutrition as they require to achieve maximum yields.

One of the most overlooked soil characteristics that causes nutrient availability issues in Central Alberta is soil pH.

In acid soils, low levels of calcium can impede root development, thereby reducing the plant's ability to access water and nutrients.

Research shows that when soil pH is increased from slightly acidic (5.5 to 5.9) to nearly neutral (7.0) nutrient availability and uptake is greatly increased.



*Nutrient availability and uptake is greatly increased in neutral pH soils.*

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## Benefits of The By-Product

Area landowners who have received this beneficial soil amendment have seen improvements in the pH of their soil, as well as an improved balance of cations in the base saturation of their soil, as shown in the accompanying charts.

### Sample Soil Test Report Prior to Soil Enhancement

Depth	OM	P	P1	P2	K	Mg	Ca	pH	pH B	CEC	%K	%Mg	%Ca	%H	%Na
0-6"	4.6	22	45	0	200	220	2120	5.9	6.4	20.2	2.5	9.1	52.5	35.7	0.2
6-12"	3.1	0	0	0	93	265	2730	6.9	6.9	17.3	1.4	12.7	78.8	6.9	0.2
Depth	S	N	Cl	Zn	Mn	Fe	Cu	B	SS	Sat P%	Al	K/Mg	Na		
0-6"	11	5	3	2.9	42	84	0.7	0.5	0.1	7	604	0.27	11		
6-12"	8	2	0	0	0	0	0	0	0		0	0.11	8		

### Sample Soil Test Report After Receiving Soil Enhancement

Depth	OM	P	P1	P2	K	Mg	Ca	pH	pH B	CEC	%K	%Mg	%Ca	%H	%Na
0-6"	5.7	0	0	0	197	330	2700	6.8	6.9	18	2.8	15.3	75	6.7	0.2
Depth	S	N	Cl	Zn	Mn	Fe	Cu	B	SS	Sat P%	Al	K/Mg	Na		
0-6"	24	19	0	0	0	0	0	0	0		0	0.18	10		

## Characteristics of The By-Product

NOVA Chemicals Joffre Site uses lime in its process for the purpose of removing hardness from water extracted from the Red Deer River. This process forms a spent lime / calcium carbonate slurry that is stored on-site in settling ponds.

In addition, approximately 50% of the spent lime sludge is re-used in the phosphorus removal process which treats water from our operations prior to its return to the Red Deer River. The PRS sludge is primarily calcium carbonate with a small concentration of organic materials such as carbon, nitrogen and phosphorus as well as some inorganic elements such as metals in low concentrations.

**The characteristics of the spent lime / phosphate by-product generated by the water and wastewater treatment processes are well understood and have been monitored since the PRS was started up in August 2000.**

Because monitoring has shown little difference in the chemistry or characteristics of the PRS and water softening sludges they are considered a single issue and are managed in identical fashion.

### Typical Lime Slurry Analysis— NOVA Chemicals Joffre Site By-Product

Total Nitrogen	0.13%
Total Phosphorus	0.37%
Total Calcium	30.80%
Total Magnesium	4.90%
Total Neutralizing Value (CCE)	91.96%



**For more information on the Soil Enhancement Program, or to request an assessment of your lands for inclusion in the program, please contact:**

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