

Effects of Cropping Sequence, Ripping, and Manure on Pipeline Reclamation in Western North Dakota

Submitted by:

North Dakota State University – Williston
Research Extension Center

- Request for - \$652,640; Total Project Costs - \$1,305,280**
Project Duration: 4 years

PROJECT DESCRIPTION

This study will address several agronomic and ecological issues that result from pipeline installation such as:

- Mixing of topsoil with subsoil changes texture and other physical and chemical characteristics of the reapplied soil surface.
- Compaction (bulk density) of topsoil and the underlying matrix restricts root growth and plant development.
- Soil organic matter and beneficial soil organisms are reduced in disturbed soils.

Work to be accomplished in this project is:

- Conducting a field-based study at the Williston Research Extension Center on a section of recently installed pipeline.
- By sampling soil characteristics and crop performance evaluate the effectiveness of multiple annual cropping sequences and perennial vegetation covers to improve soil health and crop performance.
- Evaluate ripping (deep tillage) and manure incorporation because it is not known if aggressive, deep rooted crops can improve severely compacted soils in a reclamation setting.
- All cropping sequences, ripping, and manure will be applied across different disturbance areas which commonly exist on pipeline Right-of-Ways. The identified areas are the pipeline trench, access road (parallel to the trench), and undisturbed area (reference area). Each area exhibits unique soil characteristics that may require different long-term reclamation practices to be sustainably returned to agronomic productivity.

TECHNICAL REVIEWERS' RATING SUMMARY

Technical Reviewer

Statement	Weighting Factor	<u>G-41-03A</u>	<u>G-41-03B</u>	<u>G-41-03C</u>	<u>Average Weighted Score</u>
Objectives	9	4	3	3	27
Achievability	7	3	3	4	21
Methodology	8	4	3	4	24
Contribution	8	3	3	4	24
Awareness / Background	5	3	2	4	15
Project Management	3	4	3	2	9
Equipment / Facilities	2	4	4	4	8
Value / Industry- Budget	4	4	3	3	12
Financial Match – Budget	4	4	3	3	12
Average Weighted Score		180	147	177	168
Maximum Weighted Score				250 possible points	

TECHNICAL REVIEWER TOTALS

- ◎ G-41-03A

Average Weighted Score: **180 out of 250**

FUND

- ◎ G-41-03B

Average Weighted Score: **147 out of 250**

FUNDING TO BE CONSIDERED

- ◎ G-41-03C

Average Weighted Score: **177 out of 250**

FUND

DIRECTOR'S RECOMMENDATIONS

To Fund all direct expenses in the amount of \$517,968 with the following contingencies:

- 1. Establishment of a task force with industry and Department of Mineral Resources representation to assist with the study process;**
- 2. Presentation made at the annual reclamation conference;**
- 3. Presentation of the final report to industry representatives at the Williston Experiment Station.**