SOYBEAN CYST NEMATODE CONSTRUCTION MITIGATION MEMO

Date: Tuesday, June 30, 2015

Project: Big Stone South to Ellendale (BSSE) 345kV Transmission Line, Docket EL 13-028

Subject: SCN Memo #4: BSSE SCN Construction Mitigation

BACKGROUND INFORMATION

The Public Utilities Commission of South Dakota (the Commission) granted Montana-Dakota Utilities Co. and Otter Tail Power Company (jointly, the Owners) a permit to construct and operate a 160- to 170-mile-long 345 kV transmission line from a new substation to be built near Ellendale, North Dakota to the Big Stone South Substation near Big Stone City, South Dakota (the Project). Condition 17 of the Permit, as amended by the Commission's August 22, 2014 Order, states:

> *Applicant shall develop and implement a mitigation plan to minimize the spread of soybean cyst nematode, consistent with Exhibit 23, in consultation with a crop pest expert. After Applicant has finished the soil sample field assessment in accordance with the specifications for such assessment prepared in consultation with an expert in the proper methodology for performing such a sampling survey, Applicant shall submit to the Commission a summary report of the results of the field assessment and Applicant's specific mitigation plans for minimizing the risk of the spread of soybean cyst nematode from contaminated locations to uncontaminated locations. At such time and throughout the construction period, one or more Commissioners or Staff shall have the right to request of Applicant confidential access to the survey results to enable the verification of the survey results, assess the appropriateness of the mitigation measures to address such results, and monitor the execution of the plan during construction.*

The Owners, in consultation with a crop pest expert from South Dakota State University (SDSU), have developed this mitigation plan for construction.

SUMMARY OF ACTIVITIES

In consultation with SDSU, the Project considered the potential for spreading soybean cyst nematode (SCN) as a result of all of the activities before and during construction for each phase of the Project. Generally, SCN can be spread through the movement of soil and the inadvertent transporting of soil on people or construction equipment during construction activities. After considering how the construction activities could impact the spread of SCN, the Project

identified the possible mitigation techniques. The extent at which the spread of SCN can be mitigated has a spectrum of effectiveness.

Although some mitigation may be more effective at reducing the risk of spreading SCN, no mitigation can be guaranteed to completely reduce the risk of the migration of SCN. As indicated in this memorandum, the Project, based on its experience to date and after consultation with SDSU, has concluded that manual cleaning is the most appropriate mitigation technique. Other than manual cleaning, employment of additional mitigation techniques is typically not warranted. As the evidence at the contested case hearing indicated, SCN can be spread through various other ways, including wind, water erosion, farming techniques, and animals such as birds. (Transcript from June 10-11, 2014, Evidentiary Hearing at pp. 244-45, 256-60, 270-71).

ANALYSIS OF PROPOSED MITIGATION MEASURES

As required by Condition 17 of the Permit, the Project has developed and implemented an SCN testing methodology. This testing protocol and summary of test results are addressed in memorandum #3 - Soil Sample Methodology and Test Results filed with the Commission. Egg counts were provided by SDSU in test results as they are an indicator of level of infection and used in determining management strategy. Lower egg counts indicate impacts from an infection that is more manageable by the producer. Although each parcel of land is unique, an egg count of 1-2,000 eggs/100 cm^3 is considered a low infection, 2,001 – 12,000 is considered a medium infection and egg counts over 12,000 eggs/100 cm^3 is considered highly infected (Byamukama & Tande, 2013).

The Project chose to treat all infected fields equally, but it is important to note that 43.9% of the SCN positive fields tested in the low infection range, with the highest SCN egg count result being 3,950 eggs/100 cm^3. SCN test results conducted by the Project may not be a complete reflection of a field's SCN infection because samples were only collected in the 500-foot Sampling Area. SCN is known to affect some areas more than others in a cultivated field including areas of higher pH, low spots, spots prone to flooding, and field entrances (Byamukama & Tande, 2013). Because construction and maintenance of the Project is not expected to impact an entire field crossed by the Project, and after consultation with SDSU, the Project determined not to test outside of the Sample Area. Landowners are encouraged to continue to test their land for SCN including outside of the Project's Sample Area to better understand and develop their own SCN management plans.

The Project has developed this mitigation plan to minimize the spread of SCN from infected parcels to uninfected parcels during construction activities. Based upon the Project's

consultation with our crop pest expert at SDSU, the testimony provided by Dr. Tylka at the contested case hearing on the facility permit, and the Project's SCN mitigation experience to date from implementing SCN minimization measures during soil sampling and geotechnical soil boring, the Project has concluded that the most appropriate mitigation technique will be manual cleaning of equipment and persons working in infected fields. Manual cleaning involves scraping or other form of removal of the dirt off of equipment and personnel shoes and boots before they leave an infected field.

SCN is spread through the transportation of contaminated soil. Removing adhered soil from equipment and persons before moving from parcel to parcel should reasonably minimize the spread of SCN. Manual removal of soil is an effective method of preventing the spread of contaminated soil, and this is the same method used by Dr. Tylka and his team. (Transcript from June 10-11, 2014, Evidentiary Hearing at p.259).

In choosing manual cleaning as the appropriate mitigation technique, the Project also considered and rejected water or washing stations as a primary method of removing soil. In the Project's experience, manual cleaning creates significantly less mud and subsequent SCN spreading risk than when compared to using water or water stations. When water was used to clean larger equipment, mud became less viscous and inadvertently spread further distances including neighboring fields where roads and road rights-of-way (ROWs) were narrow. Additionally, where dirt roads were present the ROW was typically too narrow for larger equipment to be located only within the vegetated buffer of the ROW and instead had to go partly on the public roads. The mud left from the water cleaning posed a risk to spreading SCN where vehicles drove through them, including the equipment that was just cleaned.

When SCN infects a field, a producer can employ various mitigation techniques to limit the impact of SCN infection. As part of the testing protocol, the Project intends to provide each landowner with the test results from the sampling process. Attached is the landowner letter and results form which is being mailed during the week of June 29, 2015. As further confirmed by the Project's work with SDSU and the Project's investigation into SCN, producers can manage SCN infection by employing techniques such as planting SCN resistant soybeans, rotating types of SCN resistant soybean seed, and using crop rotation techniques. The cost for SCN resistant soybean seed is not materially different than the cost of non-resistant soybean seed.

MITIGATION MEASURES

As stated above, manually cleaning will be the primary method to remove soil from equipment and personnel. Also, as a part of the Project's SCN mitigation plan, the following best management practices (BMPs) will be utilized on parcels that tested positive for SCN, (Table 1).

INSPECTION AND MONITORING

To observe that the construction crews are mitigating the risk of spreading SCN consistent with this memorandum, the Project will have staff trained to inspect and monitor mitigation activities. Geotechnical investigations and construction of the Project will require ongoing inspection and monitoring to confirm compliance with SCN mitigation measures. The methods for inspecting and monitoring this work include:

- Protocols will be built into the day-to-day work of the geotechnical and construction staff who will be trained on the mitigation required and will include completing daily checklist forms reviewed by a supervisor.
- Periodic visits: Trained staff member(s) will conduct periodic visits. Schedule will be an averaged reoccurring visit of once a week plus as needed and determined by the Project for inspection and monitoring.
- A cleaning log will be kept at the access points of SCN parcels during soil disturbing construction. All vehicular equipment exiting a contaminated field will be required to sign out that they were cleaned before exiting
- Full time staff monitor: A trained staff member will be hired full-time during construction for environmental inspections. This staff member will be trained to inspect and monitor for implementation of SCN mitigation measures as outlined in this memo and will assist crews in selecting and documenting the appropriate mitigation technique to be used.