TRC
14 Gabriel Drive
Augusta, ME 04330

Main 207.620.3800
Fax 207.621.8226

Memorandum

To: **Marcia Spencer-Famous**

From: Dana Valleau, TRC

Subject: **DP 4860 Kibby Expansion, Response to State Soil Scientist Comments, as Transmitted via E-mail January 29, 2010**

Date: April 8, 2010

CC:

This memo provides a response to comments provided to LURC by Dave Rocque, the State Soil Scientist, on TransCanada's application for the Kibby Expansion Project. The comments are incorporated below and each is followed by TransCanada's response.

Comment 1. The 0.6 mile long *temporary skidder road for clearing* of the ridgeline. The soils where this skidder road will be constructed are cryic and have thixotrophic properties meaning that they rut easily. This activity is proposed to take place in late summer which is a good time to do so but care must still be taken to avoid rutting. Rutting can alter the natural hydrology and cause erosion and sedimentation. Will this activity be under the supervision of the land owner or TransCanada? I would like to see TransCanada supervise the clearing so that it is done appropriately.

TransCanada Response. TransCanada appreciates the importance of ensuring that all clearing activities area carried out appropriately. As a result, all construction activities related to the Kibby Expansion Project, including construction of the temporary skidder road, that have the potential for soil disturbance or other affects on natural resources will be under the supervision of a TransCanada or contractor environmental inspector.

Comment 2. *Acid Rock Testing and Mitigation Plan*:

a. For temporary mitigation measures, *Neutralization* does not seem like a good option to me. It consists of placing a high pH material in drainage ditches (which may or may not exist in the blast area) immediately down gradient of the blast area. My concern is that there are likely to be fractures in the blasted rock that will allow acid water to move

into the groundwater table. *Removal* would help regarding any blasted rock that is acid but you would still have the exposed faces of the blast area. *Isolation* seems to me to be the best option to protect groundwater and adjacent areas.

TransCanada Response. Comments noted. The Acid Rock Testing and Mitigation Plan (the "Acid Rock Plan") proposed for the Kibby Expansion Project is the same plan approved for and used successfully during construction of the Kibby Wind Power Project (the "Kibby Project"). The Acid Rock Plan sets forth the basic approach; rock coring; and rock, surface and groundwater sampling and analysis parameters to be used during the pre-construction geotechnical investigations to identify the likelihood and extent of encountering acid rock or acid drainage during Project construction. As necessary during construction (e.g., where changes in bedrock are noted), additional field sampling and analysis would be conducted by a geologist or geotechnical engineer across the ridge as construction progresses.

TransCanada proposes to implement the Acid Rock Plan in the same way it was implemented during the Kibby Project; i.e., as data become available indicating the potential for encountering acid rock, it would be provided to LURC for review by the appropriate agencies, most specifically Maine DEP geologists, to determine which of the mitigation options, if any, presented in the Acid Rock plan is appropriate on a case by case basis. TransCanada believes this consultative approach has worked well in the past and will continue to provide a mechanism to properly address acid rock and acid drainage concerns during construction of the Kibby Expansion.

b. For permanent measures, I question all of the listed options. All three options can only be done if the acid rock is at least 10 feet above the groundwater table. In the mountains, the groundwater table (and/or bedrock) is generally very near the soil surface which would mean that only areas with over 10 feet of fill would be eligible for these measures. *Encapsulation* requires the use of a considerable amount of clay including 1% -3% slopes and they require an internal drain pipe in the cells to drain infiltration water. The clay will need to be imported and will be a challenge to stabilize. The infiltration pipe may allow acid water to escape. *Cut Slopes* require clay cover along with a more extensive cut face to create a slope that can be covered with clay. Shotcrete would be a better option than clay. Blasting could also cause the bedrock to fracture and allow up gradient groundwater to flow into the blast area unless sealed.

TransCanada Response. Comments noted. As mentioned above, TransCanada proposes to implement the Acid Rock Plan in the same way it was implemented during the Kibby Project, through consultations between TransCanada, its geologists or geotechnical engineers and environmental inspectors, LURC staff, the DEP geologists, the 3PI and any other appropriate agency representatives. The appropriate permanent mitigation measures will be implemented on a case by case basis, depending on the degree of acidity and amount of the acid rock that would be blasted, excavated or otherwise exposed, and the outcome of the consultation process.

c. It is my opinion that any acid rock blasted should be disposed of somewhere else. Not in or on a protected and fragile natural resource (high mountain areas). And, any exposed acid rock faces should be isolated as permanently as possible.

TransCanada Response. Concern noted. As discussed above, any final determination regarding disposal of acid rock will be made based on data collected at the time and consultation with State agencies.

Soils, E&S and Stormwater

Comment 3. ***Permanent Diversion Channels*** **(page 3-5):** I am not sure what these are but if they are to be excavated into the soil deep enough to intercept the groundwater table, they will result in the alteration of the natural hydrology. Permanent diversions for surface runoff should be a shallow ditch or should be a constructed ridge so as to protect the groundwater table and only permanently divert runoff water.

TransCanada Response. As stated on this same paragraph at the top of page 3-5 and previously on page 3-4 in the E&S Plan, these diversion channels are to be constructed before road (or turbine pad) grading activities begin to intercept clean runoff coming onto the site from up slope undisturbed areas and to direct it around or through the construction area to prevent its interaction with or generation of sediment-laden runoff. The diverted, clean water is then released down slope, with appropriate energy dissipation, to undisturbed areas. Clean water diversion channels, which may incorporate cross culverts, are to be used both during and permanently after construction.

The paragraph further states these diversion channels can be either a temporary berm (i.e., a constructed ridge) or a swale. TransCanada agrees that any such swales should be shallow and not intercept the water table. In addition, these berms or swales may remain in place as stabilized permanent features. Prior to construction, TransCanada will issue a revised E&S Plan that incorporates this clarification, as well as the other corrections and clarifications prompted by the State Soil Scientists comments, as noted below.

Comment 4. *Silt fencing* and erosion control mix berms are discussed as being interchangeable. That is usually the case but not in the mountains. The mountains have unique hydrology and soils. In some instances, where the surface of the ground is quite irregular and very stony with organic duff on the stones, use of silt fence is actually counter-productive. In those cases, silt fence should not be an option. As was observed on the Kibby project, the ditching for silt fence along side one of the roads under construction created a channel through very stony soils that shallow groundwater became concentrated in. In fact, no temporary erosion control barrier may be needed in some areas. I suggest restricting silt fence to only those areas where it is appropriate and useful. It may be advisable to have a pre-construction meeting with the contractor, the 3PI and myself to make sure the contractors understand where to use and not to use silt fence. I understand

this runs counter to what contractors are taught but mountains are not like the usual places they work.

TransCanada Response. TransCanada agrees that silt fence and erosion control mix ("ECM") berms are frequently not interchangeable, especially in the mountainous Kibby Project area. It is not the intent of the E&S Plan to indicate that these methods are interchangeable in all situations. On page 1-1 of the E&S Plan it states: "This document is designed to provide specifications for the installation and implementation of soil erosion and sedimentation control measures while allowing adequate flexibility for application of the most appropriate measures based on site-specific conditions." In Exhibit B.14.2 Erosion Control of the application it states: "This plan … incorporates the "toolbox" approach to construction which allows for field judgment to choose the best practice to suit the circumstances."

TransCanada recognizes the importance and benefits of a pre-construction meeting, and Section 3.7 of the Erosion and Sedimentation Control Implementation states that the first step is: "Conduct a walk-through of the construction areas to establish limits of work for construction activity; identify and mark sensitive resources, seep areas, springs, and the location of travel lanes." This step was intended to be used to discuss such things as where the use of silt fence is appropriate on the Kibby Expansion site and where it is not.

However, in response to the State Soil Scientist's comments, prior to construction TransCanada will revise Section 3.7 of the E&S Plan to (1) include as Step 1 in the implementation of E&S Control a preconstruction meeting between the contractor and his environmental inspector(s), the TransCanada environmental inspector(s), the 3PI and the State Soils Scientist to review and clarify the E&S control measures to be used during construction, including the appropriate and inappropriate uses of silt fence versus ECM and the need for frequent consultation throughout construction regarding the appropriate sedimentation control measures to be employed as new areas are disturbed. The walk-through of construction areas will become Step 2, and will include the contractor's E&S control representative(s), TransCanada's environmental inspector(s), the 3PI, and, if available, the State Soil Scientist. During the walk-through the appropriate and inappropriate uses of silt fence versus ECM will again be emphasized as well as the need for frequent consultation throughout construction regarding the appropriate sedimentation control measures to be employed. Other clarifications will be made in the E&S Plan (such as to page 7-2 in Section 7.2.2) that indicate silt fencing and ECM berms are not always interchangeable, and that silt fencing should be used only where appropriate.

Comment 5. What are *Isolated Seeps* (page 3-12)? How are they different from continual seeps? Will they be re-connected similar to continuous seeps?

TransCanada Response. An isolated seep is a seep which does not appear to have a continuous hydrologic connection down slope. A continuous seep area does display this

connection. Therefore, by definition, there is no hydrologic connection to reconnect between an isolated seep and down slope areas. However, the area around an isolated seep will be stabilized in a manner (primarily using stone) that will not prevent or impound seepage and will allow the percolation of water into the ground down slope to continue.

Comment 6. *Cross culverts* are suggested as being installed within or *below stone bedding* (I presume of a rock sandwich). Culverts should be installed at least a couple of inches above the bottom of a rock sandwich (unless the culvert is to be installed in a concentrated flow area that is located in a wetland) so the rock transmits water to the other side until the volume becomes too great for it to handle. That is when the culvert should be utilized. It should act like an emergency spillway.

TransCanada Response. The description of cross culverts that the State Soil Scientist is referring to (from page 3-12 of the E&S Plan) applies to a "typical" road culvert, but not to a rock sandwich with a culvert. TransCanada agrees with his description that, when concentrated flow is not present, the proper installation of a culvert is a few inches above the bottom of a rock sandwich so that it would act as an emergency spillway. Prior to construction, TransCanada will revise Section 3.8 of the E&S Plan to distinguish between the invert elevation of a cross culvert where concentrated flow is present from that in a rock sandwich where avoidance of concentrated flow is the goal. Additionally, prior to construction, TransCanada will add a detail to Sheet C-16 Civil Details I showing a rock sandwich in conjunction with a cross culvert to reflect the installation of the culvert above the bottom of the rock as described.

Comment 7. The use of *corduroy* is discussed on page 4-3. The discussion states it will be used in wetlands that are not anticipated to have standing or flowing water or saturated soils that are soft at the time of crossing. If the wetland is mineral soil, corduroy should not be needed unless the soils are soft. If the wetland is organic soil or has a thick organic layer on top, a timber mat would be more appropriate. Corduroy might be a good measure to use for crossing somewhat poorly drained soils or soils with oxyaquic conditions in the upper part when they are saturated. Corduroy should not be used in wetlands where the logs may become embedded and then have to be removed. This use seems to conflict with Wetlands on 4.2.2 where rock sandwiches are proposed to be used in wetland crossings and page 5.6 where corduroy will only be used as a last resort and then only in consultation with LURC, DEP and ACOE..

TransCanada Response. The use of corduroy is intended to be very limited and only after consultation with TransCanada and the appropriate agency personnel which, as the State Soil Scientist notes, is stated on page 5-6 of the E&S Plan. Corduroy was used as a last resort during Kibby construction, primarily in uplands, with only very limited use in wetlands. While the text on page 4-3 is not necessarily contradictory, TransCanada will

revise this discussion of the use of corduroy to be more clearly consistent with the State Soil Scientist's comments and the other sections of the E&S Plan.

Comment 8. Page 4.2.2, Construction in Wetlands, *transmission lines* should take into consideration areas that are not wetlands but are still wet such as soils with oxyaquic conditions in the upper part, groundwater seeps etc. If such areas are not crossed properly, it can be difficult to re-connect the hydrology (as evidenced with the Kibby project transmission line). It is much better to cross them properly than to have to repair the hydrology later. I would like to see a discussion in the application of how such areas will be crossed such as only during the time of year that the ground is frozen, use of corduroy or log mats etc.

TransCanada Response. TransCanada will add text to address this comment in the E&S Plan revisions to be submitted prior to construction. However, since this text will address transmission line construction in uplands which have wet soils or seeps, the new text will be added to Section 3.5 Transmission Line of the E&S Plan, not Section 4.2.2. It should be noted that, in the context of the Kibby Expansion Project, the transmission line discussion pertains primarily to the 34.5 kV collector line "homerun" from the ridge to the new substation. As stated in the application and E&S Plan, construction of the collector line home run through wetlands and other wet areas will occur during frozen ground conditions as much as is practical, but will not likely be possible for all wetlands or wet areas. The use of mats or corduroy to cross wet soils or seeps in upland areas will be indicated in the new text as potential mitigation measures for crossing these areas. As stated in Section 3.5 and other locations in the E&S Plan, the appropriate erosion control methods will be identified for these and other areas in the preconstruction walk-through.

It should be noted that, since most of the collector line home run would be adjacent to existing or new roads, access to the collector line right of way will be primarily from these roads. The need for heavy equipment to travel any significant distance down the right of way should be minimal.

Comment 9. Page 7-2 again discusses *silt fence* as being allowed although E&S mix berms are preferred. This should be revised so it is not an always an equivalent alternative or even allowed. Sometimes, no temporary erosion control measure is needed, as stated above. Flexibility should be included so that only the correct measure is used and only where necessary (it should only be used where it will serve the purpose for which it is being installed). Otherwise it is a waste of time and money and may even be counter productive.

TransCanada Response. Flexibility is the goal for implementation of erosion and sedimentation control measures. See also the response to Comment 4.

Comment 10. Page 8-1, Treatment of Concentrated Flow. This section allows for the use of *staked hay bales in swales*. I do not agree unless it is for a very short section of swale that is above the groundwater table (usually has no water in it). Rock or log check dams are much more effective and should be used. Mountains have more water to deal with than lower elevation areas making hay bale check dams even less effective. Hay bale check dams are not the equivalent of log or rock check dams.

TransCanada Response. Again, TransCanada agrees with the State Soil Scientist's comment. While the use of hay bales as one option for installing check dams to treat concentrated flows on page 8-1 is the same as that in the previously approved Kibby Project E&S Plan, TransCanada will include a revision to Section 8.1 that limits the use of hay bales in situations where intersection of the groundwater table or significant flows are anticipated.

Comment 11. Page 9-2, *temporary seeding*, is a practice that is recommended for use in disturbed soil areas between April 16 and October 31 if the area has not been permanently stabilized within 30 days. Temporary seeding may be a good practice for lower elevation areas but not for the mountains. The seed can introduce invasive species and it does not recreate the natural vegetative community for the mountains. I would prefer to see hay mulch (tacked down), E&S blankets and/or erosion control mulch used.

TransCanada Response. TransCanada agrees. Seeding in general is expected to be confined primarily to restoration of areas along the Mile 5 Road and at the new substation. As was done during Kibby Project construction, the use of ECM, anchored hay mulch or erosion and sedimentation control blankets are preferred methods at the higher elevations, all of which are listed options in Section 9.3.1.

Comment 12. Page 9-4, *permanent measures*. This section only includes a discussion of loam, seed and mulch for permanently stabilizing an area where the soil was disturbed. I do not believe that approach is appropriate for the higher elevation areas. I strongly recommend eliminating loam and seed and replacing it with erosion control mix which simulates the natural substrate much better and does not need to be maintained. The mountains do not have suitable topsoil for seeding so it would need to be brought in and then becomes a threat for sedimentation. E&S mulch is a much better option that does not need maintenance and will naturally re-vegetate. It is an acceptable permanent stabilization measure for lower elevation areas.

TransCanada Response. TransCanada will add to Section 9.3.2 the preferred use of ECM as a permanent stabilization measure at higher elevations.

Comment 13. Page 10-2, table 8 (and 11-2), shows *temporary seeding* in uplands as being not required but allowed. This should not be an option for high elevation areas, as discussed above.

TransCanada Response. The intent of the phrase "if required" in Table 8 is that seeding can be done if required by an agency or site specific conditions, and, once again, to provide flexibility in stabilization options. TransCanada understands that the use of ECM in place of seeding at higher elevations is the preferred stabilization method and has done so during Kibby Project construction. Stabilization during construction of the Kibby Expansion Project will rely heavily on the use of ECM. Table 8 is intended to show differences between BMPs to be used during the warmer months versus those used during the winter. There is no seasonal difference in the use of ECM and therefore it is not mentioned nor is its use precluded here.

Table 9 on page 11-2 is intended only to provide permanent seeding specifications for those areas where seeding is the appropriate choice for permanent stabilization. It does not preclude the use of ECM.

Comment 14. Page 10-3, (and table 9) indicates that *disturbed areas in wetlands* will be stabilized by *permanent seeding*. I do not agree with this practice. Wetlands should be repaired by replacing the top layers (muck and/or organic soil materials) that contain seeds, roots etc from native plants. If that is not possible for any reason or sufficient, I recommend using Erosion Control Mulch that could be mixed with some of the top layer material. This will more closely simulate the natural condition in the wetland and encourage native vegetation to re-colonize it.

TransCanada Response. Seeding of wetlands is intended only when required by an agency or site conditions. See also response to comment 13.

Comment 15. Page 11-3 Timing of Restoration discusses *"finished grade, seed and mulch"*. It should also include the use of E&S mulch which does not need to be seeded and mulched and is the option to use in high elevation areas.

TransCanada Response. TransCanada will change the wording in parentheses under the first two bullet points of Section 11.3 to: (finish grade, apply ECM or seed and mulch, as applicable).

Comment 16. Page 12-1, *Supervision and Inspection*. Because of the uniqueness of high elevation areas (soils and hydrology), standard techniques are not always the best approach to construction. I understand the need for completing an application which includes what is anticipated to be used but would like the application to include the flexibility to allow for diverging from the construction plans, upon consultation with myself, the 3PI and the regulator. Lessons learned from the Kibby project included cases of where some practices or measures

were used when they were not needed or the best approach. When I questioned the contractor about the use of the practices, they would indicate that they knew the practices were not needed or the best approach to use but did so anyway because they were "specified on the plans". In order to achieve the ultimate goal of completing the project by balancing cost, practicality and environmental concerns, a site specific basis is often times the best approach, particularly in challenging areas (high mountains). Since construction in the mountains is new to all of us, we can not always anticipate the most appropriate approaches. Flexibility would help overcome that deficiency.

TransCanada Response. As mentioned previously, providing the flexibility to make decisions in the field regarding the best BMP at a given location is a goal of TransCanada's E&S Plan. Section 12.0 on page 12-1 states: "Field decisions may be required regarding timing and construction activities and erosion and sedimentation control measures, proper placement and installation of erosion controls, restoration and re-vegetation and other construction related items." To help ensure that the need for this approach is communicated to the contractor, TransCanada will include in the second paragraph of Section 13.0 Environmental Training for Contractors that contractor training will also cover the uniqueness of working in fragile mountain areas, the emphasis on the use of ECM versus silt fence and/or seeding, rock sandwiches versus channelized conveyance structures, and the need for frequent communication and consultation with inspectors and agency personnel about the most appropriate BMPs to be utilized and where. The importance of flexibility will be incorporated into the contractor training program itself, with a stipulation that under certain field conditions an inspector or agency representative may recommend diverging from the BMP shown on Project plans.

Comment 17. *Typical Road Section – Wet Areas.* This detail calls for 2"-3" stone in geogrid over filter fabric. I am not sure how well goegrid filled with stone would transmit water from one side of a road to the other. Unless I am mistaken, a standard rock sandwich would be more appropriate. It may be fine for small wet areas where there is no surficial hydrology connection.

TransCanada Response. The use of geogrid in a rock sandwich is incorrect. This detail (Figure 2) will be corrected to say: "Overlay existing ground with geotextile fabric."

Comment 18. Civil Details (construction drawings) – Some of the road cross-section details such as R/C2 (drawing C-2) show a significant cut on long slopes with a ditch at the upslope edge of the road. If the slope is long enough and has a large enough contributing watershed, even if the soil is shallow to bedrock (20" as shown on the soil map for R/C2) there will be a significant amount of groundwater intercepted in the ditch. In those cases, I would like to see a rock sandwich, under drain pipes outletting to a header pipe at the toe of a rock fill road or, at the minimum, cross-culverts used to re-connect the natural hydrology.

TransCanada Response. In most cases on Sheet C-2 a cross culvert is shown about every 300-feet to convey the surface runoff and seepage from above the ridge road. Rock sandwiches at the culvert locations can be added if necessary, and rock sandwiches may be installed in lieu of culverts at some locations, based on review of actual field conditions at the time of construction (a.k.a. the tool box approach). As mentioned in the response to comment 6, a detail will be added to Sheet C-16 showing a rock sandwich used in conjunction with a cross culvert, with the invert of the culvert 3-6 inches above the bottom of the stone.

Comment 19. Many of the fill extensions are shown on the plan and profile sheets as being 3:1 or less steep. Such a gentle fill slope is not necessary if blasted rock is to be used as the primary fill material. A fill slope of 2:1 or steeper is acceptable when blasted rock is the primary fill material. A fill slope of 3:1 or less would be costly and will require the alteration of much more high mountain area than is needed. I am concerned that if the plan shows such shallow fill slopes the contractor will believe they are obligated to follow them and cause a more significant impact on the mountain than there should be (Tower T-1 is a good example). I therefore, recommend revising the plan to show a steeper fill slope and maybe including a note that fill slopes are not to exceed 2:1 unless otherwise specified.

TransCanada Response. The contour interval on the plan and profile sheets is 2 feet. As a result, the fill slopes along the ridge tops and at all turbine locations with fill extensions are expected to be constructed of blast rock and other stone, are shown at 1.5H:1V. The intent is that rock fill slopes be no gentler than 1.5:1 and in some cases may be as steep as 1:1 to reduce the Project footprint, provided the slope is expected to be stable.

Comment 20. There are a couple areas where it appears a rock sandwich and/or a culvert may be needed but are not shown on the plans. Sheet C-6, station 8+50+/- is one and sheet C-8, station 7+50 +/- is another. Sheet C-6 shows a plunge pool but no culvert near station 7+50. These can be confirmed by an on-site visit this summer. It also looks like a culvert is needed on sheet C-3, station 78+50.

TransCanada Response. TransCanada agrees that the best way to resolve these comments is in the field prior to construction. The need for additional culverts and/or rock sandwiches can then be based on review of actual field conditions. In some cases these are fill areas so the fill material will consist of fragmented rock which will act as a rock sandwich.