

## TECHNICAL REVIEW MEMORANDUM

*Bureau of Land Resources*

TO: **Jim Beyer, Project Manager – Bureau of Land Resources**  
FROM: **Kerem Gungor, Environmental Engineer-- Bureau of Land Resources**  
RE: **Central Maine Power Company, New England Clean Energy Connect,  
L-27625-26-A-N**  
DATE: **December 21, 2018**

I have reviewed the submittals delivered to the Department in response to my technical review memorandum dated January, 2018 on the proposed *New England Clean Energy Connect (NECEC)* project.

**APPLICANT:** CMP

**DEP#:** L-27625-26-A-N

**Primary Contact for the Applicant:** Gerry Mirabile

**Project description:** NECEC which mainly includes transmission line construction and improvements, substation improvements, one new converter station and one new substation construction.

**Resultant impervious area<sup>1</sup>:** 13.25 ac

**Resultant developed area<sup>2</sup>:** 20.18 ac

**Standards applicable to the project:** Basic, flooding, general, phosphorus, discharge to wetlands, and redistribution of stormwater discharges.

### **A. STORMWATER SUBMITTALS**

The electronic submittals, portable document files (PDFs), in response to my technical review memorandum dated January, 2018 were received by the Department in July, 2018 and are accessible from <https://www.maine.gov/dep/ftp/projects/necec/response-comments/Response%20to%20Storm%20Water%20Memo/> :

- Response MDEP 1-18 Tech Rev Memo 6-29-2018.pdf: 383-page document that includes the entire response submittals:
  - Response letter dated 6/29/18, signed by *Gerry J. Mirabile*, CMP Environmental Projects Manager.
  - Attachment A. MDEP Technical Review Memorandum – January 2018.
  - Attachment B. Exhibit 4-1. Environmental Guidelines for Construction and Maintenance Activities on Transmission Lines and Substation Projects (Revised).

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<sup>1</sup> Proposed transmission line work and existing substation improvements will not create jurisdictional impervious area. Therefore, the given resultant impervious area figure is the total figure for the two new substations and two new underground transmission termination stations: 3.90 ac for Fickett Road substation; 7.15 ac (substation pad) + 0.96 ac (access road) for Merrill Road substation; 0.61 ac for Moxie Gore station; 0.63 ac for West Forks station.

<sup>2</sup> Proposed transmission line work and existing substation improvements will not create jurisdictional developed area. Therefore, the given resultant developed area figure is the total figure for the two new substations and two new underground transmission termination stations: 10.71 ac (substation pad) + 2.71 ac (access road) for Merrill Road substation; 4.87 ac (total) for Fickett Road substation; 0.86 ac for Moxie Gore station; 1.03 ac for West Forks station.

- Attachment C. Typical Figure: Erosion and Sedimentation Controls for Structure Installation in High Risk Areas.
- Attachment D. Fickett Road Substation Stormwater Plan Revisions.
- Attachment E. Merrill Road Converter Station Stormwater Plan Revisions.

I also reviewed the following geotechnical engineering reports as they are pertinent to my technical review. The pdfs are accessible from <https://www.maine.gov/dep/ftp/projects/necec/response-comments/>:

- 17-1017 Geotech Report.pdf: 51-page document.
  - Explorations and Geotechnical Engineering Services Report (for) Proposed Converter Station Merrill Road Lewiston, Maine. Dated 5/11/18, prepared by *S.W. Cole Engineering Inc.*, signed and sealed by *Paul F. Kohler, P.E.*
- Fickett Road SS Geotech Report 6-19-2018.pdf: 56-page document.
  - Explorations and Geotechnical Engineering Services Report (for) Proposed Substation Fickett Road Pownal, Maine. Dated 6/19/18, prepared by *S.W. Cole Engineering Inc.*, signed and sealed by *Paul F. Kohler, P.E.*

After the receipt of the above submittals, the applicant revised Merrill Rd Converter Substation design and subsequently provided the following electronic documents to the Department (Hardcopies of the submittals were received by the Department on 8/17/18). The PDFs are accessible from <https://www.maine.gov/dep/ftp/projects/necec/response-comments/2018-08-14%20Responses%20to%20Comments/> :

- 2018-08-13 NECEC Supplemental Application Materials Submittal - Final.pdf: 24-page document.
  - Cover letter dated 8/13/18 and signed by *Gerry J. Mirabile*. Please note that Item #7 (page 4) and page 10 of the letter are directly related to the stormwater management.
- 2018-08-14 Attachment H - NECEC Revised Merrill Road Converter Station Stormwater Management Plan.pdf: 198-page document including the following plan sheets:
  - 1076-003-001. General Site Plan Existing Conditions Sh 1 of 2. Revised 7/12/18.
  - 1076-003-001. General Site Plan Proposed Conditions Sh 2 of 2. Revised 7/12/18.
  - 1076-003-002. Grading Plan Sh 1 of 5. Revised 7/12/18.
  - 1076-003-002. Stormwater Treatment Plan Sh 2 of 5. Revised 8/9/18.
  - 1076-003-002. Pre-development Stormwater Plan Sh 3 of 5. Revised 8/9/18.
  - 1076-003-002. Post-development Stormwater Plan Sh 4 of 5. Revised 8/9/18.
  - 1076-003-002. Stormwater Treatment Plan Sh 5 of 5. Revised 8/9/18.
  - 1076-003-003. Erosion and Sediment Control Plan 1 Sh 1 of 2. Revised 7/12/18.
  - 1076-003-003. Erosion and Sediment Control Plan 2 Sh 2 of 2. Revised 7/12/18.
  - 1076-003-004. Road Plan and Profile 1 Sh 1 of 2. Revised 7/12/18.
  - 1076-003-004. Road Plan and Profile 2 Sh 2 of 2. Revised 7/12/18.
  - 1076-003-005. Site Details 1 Sh 1 of 6. Revised 8/9/18.
  - 1076-003-005. Site Details Sh 5 of 6. Dated 5/29/18.
  - 1076-003-005. Site Details Sh 6 of 6. Revised 8/9/18.

The plan sheets above were signed and sealed by *Kenneth R. Volock, P.E.*

- 2018-08-14 Attachment I - NECEC Revised Fickett Road Substation Stormwater Management Drawings.pdf: 129-page document including the following plan sheets:
  - 1077-003-003. Stormwater Treatment Plan Sh 1 of 3. Dated 5/29/18.
  - 1077-003-003. Post-development Stormwater Plan. Sh 3 of 3. Dated 5/29/18.
  - 1077-003-005. Site Details 4 Sh 4 of 5. Dated 5/29/18.
  - 1077-003-005. Site Details 5 Sh 5 of 5. Dated 5/29/18.

The plan sheets above were signed and sealed by *Kenneth R. Volock, P.E.*

The applicant provided the following amendment dated 10/19/18 to the Site Location of Development Act (SLODA) permit application, which is accessible online from <https://www.maine.gov/dep/ftp/projects/necec/applications/hdd-amend/>. The amendment is about the horizontal directional drill (HDD) proposed for the Upper Kennebec River crossing:

- NECEC Kennebec River HDD Site Law Application Amendment\_10.19.18.pdf: 250-page document. Relevant sections used in my technical review are:
  - Section 1. Development Description.
  - Section 4. Technical Ability.
  - Section 11. Soils.
    - Exhibit 11-1. Class B High Intensity Soil Surveys.
      - Class B High Intensity Soil Survey for Central Maine Power Company Electrical Substation Moxie Gore, ME by *Robert Vile Soil Consulting Inc.* dated 10/16/18.
        - Four soil test pit logs sealed by *Robert Vile, C.S.S.*
        - Class B High Intensity Soil Survey Map. Central Maine Power Company Corridor Moxie Gore, Somerset County, Maine. Dated 10/16/18, signed and sealed by *Robert Vile, C.S.S.*
      - Class B High Intensity Soil Survey for Central Maine Power Company Electrical Substation West Forks Plantation, ME by *Robert Vile Soil Consulting Inc.* dated 10/16/18.
        - Six soil test pit logs sealed by *Robert Vile, C.S.S.*
        - Class B High Intensity Soil Survey Map. Central Maine Power Company Corridor West Forks, Somerset County, Maine. Dated 10/16/18, signed and sealed by *Robert Vile, C.S.S.*
    - Exhibit 11-2. Geotechnical Feasibility Review Memorandum dated 10/17/18 by *Wade A. Narin van Court, Ph.D., P.E.*
  - Section 12. Stormwater Management.
    - Exhibit 12-1. Stormwater Plans.
      - Stormwater Management Report (Dated October, 2018) by *TRC*
        - Plan sheets:
          - G-1. Cover Sheet & Drawing Index. Unsealed.
          - G-2. General Notes, Legend & Vicinity Map.
          - C-1. HDD Crossing (Sta 0+00 to 20+50) Plan & Profile.
          - C-2. HDD Crossing (Sta 20+50 to 36+00) Plan & Profile.
          - C-3. Grading & Restoration Plan Moxie Gore.
          - C-4. Grading & Restoration Plan West Forks.
          - C-5. Cross-sections & HDD Details 1.
          - C-6. Cross-sections & HDD Details 2.
          - C-7. Erosion Control Notes & Details 1.

- C-8. Erosion Control Notes & Details 2.
- SW-1. Pre-development Watershed Plan (West Forks Station).
- SW-2. Post-development Watershed Plan (West Forks Station).
- SW-3. Pre-development Watershed Plan (Moxie Gore Station).
- SW-4. Post-development Watershed Plan (Moxie Gore Station).

The above plan sheets were dated 10/5/18, signed and sealed by *Ricky A. Young, P.E.* on Oct. 19 or Oct. 18, 2018 unless stated otherwise.

**B. REVIEW OF THE APPLICANT’S SUBMITTALS**

Central Maine Power Company (CMP) provided itemized responses in the letter dated 6/29/18 and signed by *Gerry J. Mirabile* to the itemized comments stated in my technical review memorandum dated January, 2018. Significant amendments made to NECEC project are summarized below:

- “Environmental Guidelines for Construction and Maintenance Activities on Transmission Lines and Substation Projects” document has been amended with (a) water bar, sediment basin/trap, and flow diversion berm typical drawings, (b) directions for diverting upgradient runoff traversing the right-of-way (ROW), (c) directions for the use of additional erosion sedimentation control (ESC) measures in low points receiving runoff from steep ROW.
- The applicant provided a table showing the sections of *Segment 1* with higher erosion risk (i.e. the table titled *Segment 1: Areas with high erosion risk* in the response letter). The high erosion risk areas were determined using geospatial analysis with the soil erodibility and slope criteria. High erosion risk sections stretching more than one mile are given in the descending order below:

Structure Number		Linear distance (miles)	Approximate Location
From	To		
3006-199	3006-258	11.4	Three Slide Mountain to Smart Mountain
3006-175	3006-197	3.8	South of Number 5 Mountain
3006-271	3006-287	3.3	North of Van Dyke Mountain to US & Canada Border
3006-104	3006-119	2.8	Coburn Mountain
3006-77	3006-84	1.3	South of Johnson Mountain
3006-87	3006-93	1.1	West of Johnson Mountain
3006-53	3006-60	1.1	Little Wilson Hill Pond and Tobey Pond

Total linear distance of the higher erosion risk sections is 31.2 miles, which constitutes approximately 58% of the 53.5-mile long *Segment 1*. Please see Comment #1 below under Section C.A.

The applicant has revised the access road orientation for the proposed *Merrill Road* converter substation and proposed two gravel wetland stormwater measures to treat the road runoff.

CMP has revised the proposed Kennebec River crossing: an underground cable conduit will be installed using horizontal directional drilling (HDD) technique instead of the overhead transmission line originally

proposed. Approximate linear length of the underground cable conduit, hereafter HDD line, will be 3,000 ft as shown in C-1 and C-2 plan sheets. Typical cross-section of the HDD bore is shown in C-5 plan sheet: 36" steel casing containing several conduits in a 48" borehole. Proposed length of the HDD line which will be under the Kennebec River is approximately 320 ft and the HDD line will be 55 to 75 ft deep from the bottom of the river bed. Remaining section of the HDD line will be under steep, wooded embankments of the river. Two temporary HDD platforms will be built on each side of the river: 125'x150' (East bank of the river, Moxie Gore) and 100'x150' (West bank of the river, West Forks). From the exit/entry points of HDD line, the underground transmission lines will be connected via trenches (see the detail in C-5 plan sheet for the trenching) to the permanent 135'x135' termination stations on each side of the river. The temporary platform and termination station in Moxie Gore and West Forks can be seen in C-3 and C-4 and plan sheets, respectively. After the construction, the temporary platforms and their gravel access roads will be revegetated and restored to the pre-existing condition (see *Restoration Note* in C-3 and C-4 plan sheets). The erosion and sedimentation control (ESC) plan submissions are:

- **Location plan.** Sediment barrier locations shown in C-3 and C-4 plan sheets.
- **Erosion and sedimentation control notes.** C-8 plan sheet.
- **Construction and installation details.** C-7 and C-8 plan sheets.

### C. STORMWATER MANAGEMENT

I have eleven comments requiring the applicant's response:

#### A. **Basic Standards**

**Note:** *As always, the applicant's erosion control plan is a good starting point for providing protection during construction. However, based on site and weather conditions during construction, additional erosion and sediment control measures may necessary to stop soil from leaving the site. In addition, other measures may be necessary for winter construction. All areas of instability and erosion must be repaired immediately during construction and need to be maintained until the site is fully stabilized or vegetation is established. Approval of this plan does not allow unauthorized discharges from the site.*

1. Please amend "Section 14. Basic Standards" of the application with the following and submit the full-text of the amended section for review:
  - a. Page 14-2: Insert the "order of construction operations" response given in the second page of the response letter dated 6/29/18 where appropriate,
  - b. Create a separate subsection (i.e. Subsection 14.2) titled "*Best Management Practices for Segment 1 Higher Erosion Risk Areas*" which includes the following:
    - i. Response #2 (page 2 of the response letter) including *Segment 1: Areas with higher erosion risk* table,
    - ii. Each week, erosion and sedimentation control (ESC) inspection and maintenance log to be kept by the ESC crew shall be reviewed by the third-party inspectors who shall report their findings to the Department per Chapter 500 Appendix B(1)(c),
    - iii. Prior to the construction, CMP shall provide a construction plan including the construction timetable, access roads to be used in the construction, contractor, ESC crew, environmental inspector and third-party inspector information – long stretches of high risk areas (e.g. 11.4-mile section between structures 3006-199 & 3006-258) may need multiple inspectors- for the Department's review and approval,

- iv. CMP shall provide a plan showing the project's progress (disturbed, stabilized areas) to the Department monthly during the construction,
  - c. Exhibit 14-1: "Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects" (Revised 6/29/2018)
2. In response to the discussions held between the applicant's representative and the Department staff (see *Mr. Mirabile's* letter dated 8/13/18, page 10), the applicant has proposed an alternative cross-section for the southeasterly cut slope, which is shown in *1076-003-005 Sh 1 of 6*. I strongly recommend the applicant to use the alternative cross-section which will reduce the disturbed area and minimize the erosion and sedimentation risk during the construction. An upgradient flow diversion structure can be necessary during the construction of the slope.

Following comments are for the HDD crossing and termination stations:

3. Environmentally sound management of the HDD fluid is a prerequisite to prevent the unauthorized discharges and sedimentation into the protected natural resources. The applicant has provided Exhibit 14-1 "*Inadvertent Fluid Release Prevention, Monitoring, and Contingency Plan*" to satisfy this requirement. The document mostly lists several criteria/requirements to be met by the HDD contractor who will prepare the site-specific inadvertent fluid release plan. Should the project be approved, I recommend the Department Order to include the following special conditions:
- a. No less than three months before the tentative HDD start date, the applicant shall submit a site-specific inadvertent fluid release prevention, monitoring, and contingency plan satisfying all the criteria given in Exhibit 14-1 of the application for the Department's review and approval,
  - b. The applicant shall retain the services of a Department-approved third-party inspector to oversee the HDD,
  - c. An on-site pre-construction meeting shall be held with the attendance of the Department-approved third-party inspector, the representatives of the Department, applicant, and HDD contractor.
4. Stormwater source control best management practices must be used to prevent unauthorized discharges due to the drilling fluid recirculation and processing. I recommend:
- a. Covering drilling fluid pits (i.e. mud pits mentioned in page 3, Section 1.4) especially during no-work period,
  - b. Using a high-efficiency, high-rate manufactured device to separate the cuttings from the drilling fluid instead of a low-rate gravity separation basin which may be exposed to weather and require a larger footprint,
  - c. Using dumpsters for the temporary storage of the cuttings and covering the dumpsters during no-work period,

Plans, technical details and specifications of the drilling fluid processing/recycling system which ensures zero drilling fluid discharge must be provided concurrently with the "*Inadvertent Fluid Release Prevention, Monitoring, and Contingency Plan*" (see Comment #4) for the Department's review and approval.

## B. General Standards

### a. Kennebec River Crossing

The applicant will be disturbing approximately 2.5 and 2.3 ac of land for the proposed *West Forks* and *Moxie Gore* stations, respectively. After the restoration of the areas temporarily disturbed for HDD, approximately one ac of developed area will be created at the *West Forks* station; post-construction developed area associated with the *Moxie Gore* station will be approximately 0.86 ac.

The applicant proposes to treat the developed area excluding the station yards using vegetated stormwater buffers. The station yards are considered as self-treating surfaces per the Department's letter dated 6/5/2008.

5. Please provide treatment summary tables for each termination station in the post-development plan sheets (315641 SW-2 & 315641 SW-4).
6. Termination Station Access Roads:
  - a. New impervious area associated with the *West Forks* access road, shown in C-4 plan sheet, is approximately half an acre. Total impervious area treated by the meadow buffer is given as  $15 \times (65+368) = 6,495$  sf in the buffer/level spreader sizing table. Using C-4 plan sheet, I calculated the minimum linear impervious area requiring treatment to be ca. 22,000 sf. Please review the level lip spreader sizing and revise if necessary. Also, please delineate the treatment area of the buffer in the post-development watershed plan (315641 SW-2).
  - b. Land cover of the *Moxie Gore* vegetated buffer is given as meadow in the sizing calculations. The buffer area appears to be forested in C-3 plan sheet. Please review.
  - c. Please clarify the new *Moxie Gore* access road grading in C-3 plan sheet. Will the road be sloped towards the swales within the landscaped island?
  - d. The proposed buffer lengths shown in C-3 and C-4 plan sheets apparently provide flow paths exceeding 150 ft, which is the value used in the sizing. Review the buffer delineations and revise the plan sheets if necessary.
7. Termination Stations: As shown in C-5 plan sheet, the termination stations will be mostly constructed on fill. Northern section of the proposed *West Forks* station will be in cut *Tunbridge* soil which has 24-36" deep bedrock as shown in the soil test pit logs. Therefore, seasonally high water table interference is not anticipated for the termination station yards.
  - a. Please confirm that the concrete slabs and similar truly impervious surfaces (curve number = 98) within the termination station yards will not exceed 0.01 ac as given in the post-development HydroCAD models (Subcatchments 1SA and 2SA). If the areas of these surfaces have been revised and increased since the latest submission, please demonstrate that the substation yard will provide minimum one-inch storage for the runoff from the truly impervious surfaces.

#### **b. Merrill Road Converter Substation**

The substation yard impervious and developed area figures have remained unchanged after the project revisions. The revised access road will result in 2.71 ac of developed area 0.96 ac of which will be impervious.

The applicant proposes to treat the linear portion of the project (i.e. access road) using two gravel wetlands as shown in *1076-003-004 Sh 1 of 2*. The proposed gravel wetlands were reviewed to determine their compliance with the design guidelines given in Maine Stormwater BMP Manual Chapter 7.4 (See Comments 8 & 9 below). The applicant proposes to use permeable road base (a.k.a. rock sandwich) to maintain the wetland connectivity between Sta 3+75 and Sta 8+00 as shown in *1076-003-044 Sh 1 of 2*; the permeable road base section of the access road is exempt from the standards per Chapter 500 Section 4(C)(5)(e). The applicant will treat 78.7 and 54.9% of the linear impervious and developed area -including the exempted crossing area-, respectively; therefore, the proposed treatment level for the linear development is well above the minimum requirements set forth in Chapter 500 Section 4(C)(5)(c).

The applicant has not made any significant revision which would affect the stormwater treatment system of the non-linear development. The proposed self-treating substation yard and grassed underdrained soil filter (GUSF) will treat 99.33 and 83.75% of the resultant non-linear impervious and developed area, respectively.

The applicant has revised the substation yard plans to incorporate a groundwater collection system so that seasonally high water table does not interfere with the stormwater detention and drainage (see *1076-003-002 Sh 1 of 5 & Sh 2 of 5*).

#### Gravel Wetlands:

8. Please provide 1":20' or larger scale plan views of the proposed gravel wetlands that:
  - a. Show location of the lateral underdrains in each cell,
  - b. Show location and number of the perforated riser pipes in each cell. Please note that a riser must be provided for every 10 linear ft of the inlet lateral underdrains per Maine Stormwater BMP Manual Chapter 7.4,
  - c. Revise the berms separating the cells. They must extend perpendicular to the flow direction without interruption and include a stable spillway. In the current plan views of the gravel wetlands (e.g. *1076-003-004 Sh 1 of 2*), the berms appear to have a sizeable opening in the middle, which may prevent the intended ponding in the upgradient cell.
  - d. Provide detailed grading and keynotes for *Gravel Wetland #1* forebay to ensure that the entire runoff enters the first/upgradient cell at a defined, stabilized (e.g. riprap spillway) entry point,
  - e. Have *Gravel Wetland #2* with only one forebay instead of two forebays. The gravel wetland design specifications call for one defined inlet which maximizes the longitudinal runoff travel path within the gravel wetland and ensures that both cells are sequentially used for the water quality volume treatment. Hence, the forebay by Sta 10+00 can remain and the other forebay can be removed. The runoff from the Sta 8+00 and Sta 10+00 section can be directed to the remaining forebay by installing a curb or another flow diversion structure.



9. “Gravel Wetland Cross Section Construction Details” & “Gravel Wetland Outlet Control Structure” in 1076-003-002 (Sh 5 of 5):
- a. The riprap emergency spillway elevations are lower than the outlet control structure (OCS) grate elevations. Please lower the OCS grate elevations to the “top of wetland soil elevation + 1.5 ft”,
  - b. Clarify the locations of the lateral underdrains in both cells and provide the pipe specifications in the gravel wetland cross sectional details.

### C. Flooding Standard

#### a. Termination Stations & Their Access Roads at the Kennebec River Crossing:

The applicant has submitted pre- and post-development hydrologic models for the drainage areas of the proposed stations. One subcatchment was used for each station in the pre-development models. The proposed termination station yards were modeled as separate subcatchments in the post-development models.

#### *Comment:*

10. Please demonstrate that the proposed 18” corrugated metal pipe culvert, shown in C-3 plan sheet, can handle the 10-yr, 24-h peak flow.

#### b. Merrill Road Converter Substation

The modeled area was expanded westerly due to the reorientation of the proposed access road as shown in 1076-003-002 pre- and post-development stormwater plans. The proposed wetlands, grassed underdrained soil filter, and stormwater conveyance structures were modeled using a revised post-development model. The applicant has demonstrated that the five proposed culverts can handle the 25-yr, 24-h peak flows.

#### *Comments:*

11. Please provide a routing diagram for the post-development model, the peak flow outputs for the outfalls A and C.

### D. Discharge to Wetlands Standard

#### a. Merrill Road Converter Substation

The proposed gravel wetland treatment measures have outfalls that will discharge into the forested wetlands as shown in 1076-003-004 Sh 1 of 2. Since the 2-yr, 24-h storm’s runoff will be retained by the constructed wetlands and the outflow will be controlled by the 7/8” orifices shown in 1076-003-002 Sh 5 of 5, the outfalls’ peak flows will be *de minimis* (i.e. 0.02 cfs as reported in the post-development model). The project will not increase the mean storage depth of the downgradient forested wetlands; hence, it complies with Chapter 500 Section 4(I).

## **E. Phosphorus Standard**

### **a. Fickett Road Substation**

The applicant has made the necessary revisions in response to my technical review memorandum dated January, 2018. The revised project phosphorus budget (PPB) and the post-treatment project phosphorus export (post-PPE) are 0.51 and 0.45 lb/yr, respectively. The post-PPE is smaller than the PPB. The revised project complies with Chapter 500 Section 4(D).

## **F. Redistribution of Stormwater Discharges**

### **a. Merrill Road Converter Substation**

The applicant eliminated *LS-1* level spreader associated with *Underdrain Soil Filter #2*, which has been replaced by the gravel wetlands. The level spreaders *LS-2* thru *LS-4* remain unchanged. The revised project complies with Chapter 500 Section 4(H).