DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Waterways Engineering and Wetlands

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AUTHORITY: This document is established in accordance with Section 1917-A of The Administrative Code of 1929, Act of April 9, 1929, P.L. 177, *as amended* ,71 P.S. § 510-17; The Clean Streams Law, Act of June 22, 1937, P.L. 1987, as amended, 35 P.S. §§ 691.1- 691.1001; Dam Safety and Encroachments Act, Act of November 26, 1978, P.L. 1375, as amended, 32 P.S. §§ 693.1- 693.27; Flood Plain Management Act, Act of October 4, 1978, P.L. 851, No. 166, as amended, 32 P.S. § § 679.101- 679.604 .; Oil and Gas Act of 2012, Act of February 14, 2012, P.L.87, No.13, 58 Pa. C.S. §§ 3201-3274; the Pennsylvania Safe Drinking Water Act, Act of May 1, 1984, P.L. 206, as amended, 35 P.S. §§ 721.1- 721.17; the Solid Waste Management Act, Act of July 7, 1980, P.L. 380, as amended, 35 P.S. §§ 6018.101-6018.1003; and the regulations promulgated under these statutes, including 25 Pa. Code Chapters 78, 78a, 91, 92a, 93, 95, 96, 102, 105, 106, 109, 287, 288, 289, 293 295, 297 and 299.

POLICY: Provides guidance on the preparation of a Department of Environmental Protection (DEP) Chapter 105 Alternatives Analysis.

PURPOSE: This guidance document consolidates existing guidance and expands upon that guidance as follows:

- Clarifies the appropriate level of analysis required for evaluating alternatives for projects requiring an Individual Water Obstruction and Encroachment Permit under 25 Pa. Code Chapter 105;
- Provides guidelines for determining if an alternative should be considered practicable;
- Establishes a common, complete, and consistent level of understanding of the information needed by the Department to adequately review alternatives analyses for water obstruction and encroachment permit applications proposing impacts to aquatic resources.

APPLICABILITY: This guidance applies to all proposed projects involving a water obstruction or encroachment located in, along, across or projecting into an aquatic resource that are not eligible for a general permit, emergency permit, or do not qualify for a waiver of permit requirements. (25 PA Code § 105.13).

DISCLAIMER: The guidance outlined in this document is intended to supplement existing requirements. Nothing in the guidance shall affect regulatory requirements.

The guidance presented herein is not an adjudication or a regulation. There is no intent on the part of the DEP to give this guidance that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this guidance if circumstances warrant.

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TABLE OF CONTENTS

I. PREAMBLE 3
A. Executive Summary 3
B. Definitions 4
II. ALTERNATIVES ANALYSIS 6
A. Background 6
B. Location Alternatives 6
C. Design Avoidance and Minimization 6
D. Components of All Alternatives Analyses 6
III. ENVIRONMENTAL AND PROJECT-SPECIFIC CONSIDERATIONS 8
A. Land Development Projects 8
B. Linear Utility Projects 9
C. Transportation Projects 10
D. Restoration and Pollution Abatement Projects 11
IV. Alternatives Analysis Process & Template of Items to Submit to the DeP 11
A. Alternatives Analysis Process 11
B. Template of Items to Submit to the Department 12
C. Example Location and Design Alternatives Analysis Summary Tables 14
D. Flowchart for Evaluating Project Alternatives 16
V. REFERENCES 17
VI. APPENDICES 18
A. NEPA vs. Chapter 105 Aternatives Analyses 18
B. Data Resource List 19

I. PREAMBLE

A. Executive Summary

The Clean Streams Law (CSL) and Dam Safety and Encroachments Act (DSEA) grant the Environmental Quality Board (EQB) the power and duty to adopt regulations and standards that are necessary and proper to carry out their purposes. 35 P.S. § 691.5 and 32 P.S. § 693.5. The CSL, enacted in 1937, is a broad reaching act which was designed to "preserve and improve the purity of the waters of the Commonwealth", and provide for "the protection of water supply and water quality" through regulating various discharges and related activities. The DSEA, enacted in 1978, applies to certain types of dams and all water obstructions and encroachments that affect watercourses, floodways and bodies of water, including wetlands (i.e. aquatic resources). The EQB promulgated the Pa Code, Title 25. Environmental Protection, Department of Environmental Protection (DEP), Chapter 105, *Dam Safety and Waterway Management* (Chapter 105) under the DSEA and CSL. One of the purposes of the DSEA and the Chapter 105 rules and regulations is to protect the natural resources, environmental rights and values, and protect the water quality, natural regime, and carrying capacity of watercourses. 32 P.S. § 693.2; See also 25 Pa. Code § 105.2. A person may not construct, operate, maintain, modify, enlarge or abandon a dam, water obstruction or encroachment without first obtaining a written authorization from DEP. 32 P.S. § 693.6, See also, 25 Pa. Code § 105.11. This authorization can be in the form of either a General Permit, Individual Permit, Small Projects Permit, Environmental Assessment (EA) Approval, emergency permit or waiver of permit requirements.

An Alternatives Analysis (AA) is an information requirement under 25 Pa. Code Chapter 105 and is a component of DEP's Individual Water Obstruction and Encroachment Permit Application. Per §105.13(e)(1)(viii), an alternatives analysis is "a detailed analysis of alternatives to the proposed action, including alternative locations, routings or designs to avoid or minimize adverse environmental impacts". To rebut the presumption that a practicable alternative does exist, the applicant should demonstrate with evidence and documentation that (§ 105.14(b)(7), 105.18a(b)(3)(ii)):

> The basic project purpose cannot be accomplished utilizing one or more other sites that would avoid, or result in less, adverse environmental impacts
>
> A reduction in the size, scope, or density of the project as proposed, or an alternative project design or configuration that would avoid, or result in fewer or less severe, adverse impacts will not accomplish the basic purpose of the project

The context for this consideration is unique for wetlands per §105.18a(a)(3) and §105.18a(b)(3), but the Department recommends that the approach outlined here be followed when looking at the broader context of alternatives analysis per §105.13(e)(1)(vii) & §105105.14(b)(7) for all aquatic and sensitive resources. Loss of aquatic and sensitive resources should only be considered when impacts are deemed to be both necessary and unavoidable. With respect to loss of wetlands, the applicant is required to replace affected wetlands to compensate for unavoidable impacts under §105.18a(a)(7) and 105.18a(b)(7). See also, 25 Pa. Code §§ 105.1 (definition of *mitigation*) and 105.20a. An applicant must also compensate for unavoidable impacts to watercourses and other bodies of water under 25 Pa. Code § 105.1 (definition of *mitigation*).

The AA should begin in the early stages of project development and should continue throughout all phases of project design. For the AA to fulfill the intended purpose of protecting aquatic and sensitive resources, applicants are required to identify all resources at risk within the project area and evaluate whether the proposed project can be altered or changed to first, avoid resource impacts and second, minimize those impacts to the greatest extent practicable. Evaluating alternatives may involve changing the size, scope, configuration, construction method, or density of the project or activity; determining availability of other properties; or relocating proposed structures or activities to avoid and minimize impacts to aquatic and sensitive resources.

B. Definitions

1. **Alternatives Analysis -** A detailed analysis of alternatives to the proposed action, including alternative locations, routings or designs to avoid or minimize adverse environmental impacts. (25 Pa. Code §105.13(e)(1)(viii))

2. **Aquatic Resources -** For the purposes of this document, the term aquatic resource refers to Regulated waters of this Commonwealth, as defined in 25 Pa. Code §105.1, which includes watercourses, streams or bodies of water (e.g. all wetlands) and their floodways wholly or partly within or forming part of the boundary of this Commonwealth. (25 Pa. Code §105.1)

3. **Body of Water -** A natural or artificial lake, pond, reservoir, swamp, marsh or wetland. (25 Pa. Code §105.1)

4. **Brownfield** – Property where the presence or potential presence of hazardous substances, pollutants or contaminants complicates expansion, redevelopment, or reuse of the property. (Brownfields Revitalization and Environmental Restoration Act of 2001, Subtitle A, Sec. 211 (a)(39)(A))

5. **Environmental Assessment** – For the purposes of this document, the term Environmental Assessment refers to the assessment as defined by the Commonwealth of Pennsylvania under the Dam Safety and Encroachments Act and the 25 Pa. Code §105 regulations. (25 Pa. Code §105.15 and Document No: 3150-PM-BWEW0017 Environmental Assessment Form)

6. **Impacts:**

   a. **Direct Impacts -** consist of filling, draining or conversion of a resource to another type such as a wetland to an open body of water. (25 Pa. Code §105.15 and Document No: 3150-PM-BWEW0017 Environmental Assessment Form)

   b. **Indirect Impacts -** consist of altering the chemical, physical or biological components of an aquatic resource to the extent that changes to the functions of the resource results. However, indirect impacts do not result in a loss of resource acreage. (25 Pa. Code §105.15 and Document No: 3150-PM-BWEW0017 Environmental Assessment Form).

   c. **Permanent Impacts -** are those areas affected by a water obstruction or encroachment that consist of both direct and indirect impacts that result from the placement or construction of a water obstruction or encroachment and include areas necessary for the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into a watercourse, floodway or body of water (25 Pa. Code §105.15 and Document No: 3150-PM-BWEW0017 Environmental Assessment Form).

   d. **Secondary Impacts –** Environmental impacts on adjacent land and aquatic resources that are associated with, but not directly resulting from, a project. (adapted from 25 Pa. Code §105.14(b)(12) and Document No: 3150-PM-BWEW0017 Environmental Assessment Form Instructions)

   e. **Temporary Impacts –** are those areas affected during the construction of a water obstruction or encroachment that consists of both direct and indirect impacts located in, along or across, or projecting into a watercourse, floodway or body of water that are restored upon completion of construction. This does not include areas that will be maintained as a result of the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into a watercourse, floodway or body of water (these are considered permanent impacts) (25 Pa. Code §105.15 and Document No: 3150-PM-BWEW0017 Environmental Assessment Form).

7. **Mitigation -** An action undertaken to accomplish one or more of the following: (A) Avoid and minimize impacts by limiting the degree or magnitude of the action and its implementation. (B) Rectify the impact by repairing, rehabilitating or restoring the impacted environment. (C) Reduce or eliminate the impact over time by preservation and maintenance operations during

the life of the action. If the impact cannot be eliminated by following clauses (A) - (C), compensate for the impact by replacing the environment impacted by the project or by providing substitute resources or environments. (25 Pa. Code §105.1)

8. **Practicable Alternative -** An alternative that is available and capable of being carried out after taking into consideration construction cost, existing technology, and logistics. An area not presently owned by the applicant which could reasonably be obtained, utilized, expanded or managed to fulfill the basic purpose of the project shall be considered as a practicable alternative (§105.18a(3), §105.18b(3)).

9. **Regulated Waters of this Commonwealth -** Watercourses, streams, or Bodies of Water and their floodways, wholly or partly within or forming part of the boundary of this Commonwealth. (25 Pa. Code §105.1)

10. **Right-of-Way (ROW) -** For highways, pipelines, and utility lines, it is the boundary line within which the applicant/operator has a legal right to do earthwork, and following construction, maintain and operate (adapted from 2012 E&S Manual).

11. **Sensitive Resources** – Areas or features affected by a project, crossing, or activity, that include: Regulated Waters of this Commonwealth (including wetlands) and their associated floodways; riparian areas; woodlands; designated habitat of threatened and endangered species; natural flow pathways/drainageways; steep slopes; natural areas; wildlife sanctuaries; public water supplies; other geographical or physical features including cultural, archaeological, and historical landmarks; National wildlife refuges; National natural landmarks; National, State, or local parks or recreation areas; and National, State, or local historical sites. (BMP 5.4.1 Pennsylvania Stormwater Best Management Practices Manual (Document No. 363-0300-002), 25 Pa. Code §105.14(b)(5))

12. **Special Concern Species -** Plant and animal species that are not listed as threatened or endangered by a jurisdictional agency but are identified on a PNDI Receipt as an at-risk species. These include: (1) plant and animal species that are classified as rare, vulnerable, and tentatively undetermined or candidate, (2) taxa of conservation concern and (3) special concern plant populations. (Document No. 021-0200-001 Policy for Pennsylvania Natural Diversity Inventory (PNDI) Coordination During Permit Review and Evaluation)

13. **Threatened and Endangered Species** – T Those animal and plant species identified as a threatened or endangered species, as determined under: Endangered Species Act of 1973, 16 U.S.C.A. §§ 1531 *et seq*.; Wild Resources Conservation Act, 32 P.S. § 5301; Fish and Boat Code, 30 Pa. C.S.A. §§ 101 *et seq*.; and Game and Wildlife Code, 34 Pa. C.S.A. §§ 101 *et seq*. This also includes animal and plant species proposed for listing as endangered and threatened, pursuant to the Endangered Species Act of 1973.

14. **Water Dependent** – The circumstance which requires a dam, water obstruction or encroachment to have access or proximity to, or siting within, Regulated Waters of this Commonwealth to fulfill the basic purposes of the project. (25 Pa. Code §§105.13(e)(1)(iii)(D); 105.13(e)(1)(x)(C); 105.14(b)(7))

15. **Watercourse -** A channel or conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow (25 Pa. Code § 105.1).

16. **Wetlands -** Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. (25 Pa. Code § 105.1). Wetlands are categorized as either Exceptional Value (EV) or Other (25 Pa. Code § 105.17).

II. ALTERNATIVES ANALYSIS

A. Background

An Alternatives Analysis (AA) is the project applicant's written documentation of efforts to avoid and minimize environmental impacts. The AA should demonstrate, with reliable and convincing evidence, that there is no other practicable alternative that would avoid or minimize impacts to aquatic or sensitive resources. In addition, the AA should be a thorough process that evaluates the practicability of available alternatives and should be reflective of project type, scope, and proposed impacts. In addition, an alternatives analysis should be consistent with existing policy and guidance including both the Environmental Assessment (EA) (Document No. 3150-PM-BWEW0017) and the Comprehensive Environmental Assessment (CEA) Policy (Document No. 310-2137-006) as applicable. Additional information related to environmental policies and guidance is found within Section D, "Components of All Alternatives Analyses" of this technical guidance document.

In general, most alternatives analyses consist of both a location and a design avoidance and minimization analysis. It is important to note that the DSEA and its companion, 25 Pa. Code Chapter 105 regulations, are more narrow in scope than the Federal National Environmental Policy Act (NEPA) process (40 CFR 1508.18). Therefore, a NEPA alternatives analysis does not satisfy the requirements of a Chapter 105 alternatives analysis. Refer to Section A. NEPA vs. Chapter 105 Alternatives Analyses in the Appendix of this document for more information.

B. Location Alternatives

The purpose of the location alternatives analysis is to identify the most appropriate land parcel(s) for the project to be sited. When locations are evaluated, areas and alignments located on land parcels both owned and not presently owned by the applicant, which could reasonably be obtained, utilized, expanded, or managed to fulfill the basic purpose of the project, should be considered. Each project is expected to have a unique set of constraints or limiting factors that influence location selection. Some constraints or limiting factors may prevent an alternative location from achieving the project purpose or may make an alternative location impracticable. In some cases, these constraints or limiting factors may prevent an alternative with less aquatic or sensitive resource impacts from being the preferred alternative or may prioritize impacts to other resources over impacts to aquatic or sensitive resources (e.g. mature forest clearing to avoid a small wetland in agricultural field).

C. Design Avoidance and Minimization

The purpose of the onsite, or design avoidance and minimization, alternatives analysis is to identify opportunities to first avoid and then minimize any impacts to aquatic and sensitive resources after a project location has been selected. An applicant should demonstrate that all necessary steps have been taken to avoid and minimize aquatic and sensitive resource impacts by considering alternate onsite designs, routings, layouts and engineering and construction techniques.

D. Components of All Alternatives Analyses

Most alternatives analyses consist of both a location and a design avoidance and minimization analysis. These analyses are project-specific and should be commensurate with the project impacts. As such, variations are expected. However, the following components are central to all water obstructions and encroachment permit applications and should also be considered on a project-specific basis.

1. Aquatic Resource Impacts – In general, a preferred alternative should not have greater impacts on aquatic resources relative to other alternatives proposed. Obtaining an accurate identification or delineation of the aquatic resources at risk is critical to evaluating and comparing impacts for selected alternatives. Field delineations of these resources may not be possible for location alternatives if permission to access the parcel(s) cannot be obtained. In these circumstances, digital resources can be used to conduct a cursory analysis. The approximate locations of many watercourses and wetlands can be identified utilizing data available from several resources, however, it should be recognized that such digital mapping resources are not meant to be precise and can be inaccurate due to the limitations of the data collection method. See Section VI, Part B of this technical guidance document for a list of resources that may be useful. For design avoidance and minimization alternatives analyses,

applicants should not rely solely upon desktop resources for identifying wetlands, streams, and other aquatic resources. Rather, a field delineation of all Regulated waters of this Commonwealth, including wetlands, must be conducted (§ 105.13(e)(1)((i)(A)). Obtaining a Preliminary Jurisdictional Determination (PJD) from the Army Corps of Engineers may be beneficial.

2. Existing Utilities, Infrastructure, and Easements/ROWs – An alternatives analysis should evaluate the constructability and feasibility of a project with respect to existing utilities, infrastructure, and easements/Right Of Ways (ROWs). If the project will require extending a service such as a public water, sewer, or natural gas line, the availability of existing utilities should be considered. In addition, determining the location of existing utilities, existing easements/ROWs, and the potential for co-location of utility lines within the same ROW or immediately adjacent to the existing ROW can affect the project's alignment, configuration, and alternatives. The Alternatives Analysis should include a discussion and associated documentation that existing utilities, infrastructure, and easements/ROWs have been considered and how they affected the choice of the preferred alternative.

3. Site Constraints – An alternatives analysis should consider if the size of the site selected is sufficient to accomplish the purpose of the proposed project; is appropriate in terms of constructability of the project; or could inherently be more hazardous to construct, operate, and maintain than the other proposed alternative locations. Sites that could be more hazardous include, but are not limited to: brownfields, superfund, or otherwise contaminated sites; sites dominated by steep slopes, highly erodible soils, or concerning geologic features (e.g. sinkholes); and sites that could compromise public health and safety.

4. Construction Cost - If an applicant states that construction cost is a limiting factor for an alternative(s), the applicant should provide a comparative cost analysis that demonstrates how construction cost impacted that decision. Note that, although an alternative may be more expensive, that alternative is not necessarily impracticable. To justify that an alternative with fewer and/or less severe aquatic and sensitive resource impacts is not the preferred alternative due to construction cost, the discussion should demonstrate that the alternative would be sufficiently expensive such that the overall project would no longer be economically feasible.

5. Existing Technology- An alternatives analysis should consider all environmental engineering and construction techniques recognized by the scientific and construction communities (See Trenchless Technology Technical Guidance Document [Doc. No. xxxxx] for examples, additional information, and considerations). The analysis should include discussion and support, through documentation and scientific reasoning, why a technology was chosen and why it was considered the preferred alternative.

6. Environmental Policy Consistency – DEP maintains policies on how it should conduct business to avoid conflicts and promote seamless compliance and coordination between local, State, and Federal agencies with respect to aquatic and sensitive resources and associated regulations. It is the responsibility of the applicant to ensure that alternatives adhere to these policies. The following sections discuss how an evaluation of alternatives relates to some of these policies:

   a) *T&E, Special Concern Species; Rare and Significant Ecological Features* - It is the policy of DEP to fully support the protection of Threatened and Endangered (T&E) and special concern species. If an alternative to avoid or minimize an impact on a resource is identified that will have a negative effect on T&E or special concern species, as defined in the "Policy for Pennsylvania Natural Diversity Inventory (PNDI) Coordination During Permit Review and Evaluation" (Document No: 021-0200-011), that alternative should not be the preferred alternative. The comments received from the jurisdictional agency responsible for the T&E, special concern species, and rare and significant ecological features should be used to assist in the determination of a preferred alternative.

   b) *Local Comprehensive Plans and Zoning Ordinances* - Acts 67, 68 and 127 of 2000 (Acts 67, 68 and 127) amended the Municipalities Planning Code to provide new tools for local governments to plan for and manage growth. Section 1105 of Act 67 and Section 619.2 of Act 68 directs that state agencies "shall consider and may rely upon comprehensive plans and zoning ordinances when reviewing applications for the funding or permitting of

infrastructure or facilities." In accordance with "Final Revision of Policy for Consideration of Local Comprehensive Plans and Zoning Ordinances in DEP Review of Permits for Facilities and Infrastructure" (Document No: 012-0200-001), comprehensive planning and zoning ordinances should be considered when selecting a preferred alternative.

c) *Prime Agricultural Lands* - In accordance with "Guidance for Implementation of the Agricultural Land Preservation Policy" (Document No. 012-0700-002), it is the policy of DEP to protect the Commonwealth's primary agricultural land from irreversible conversion to uses that result in its loss as an environmental and essential food production resource. When evaluating an alternative, the alternative being considered should not promote adverse condemnation of prime agricultural lands.

d) *Archeological Resources and Historic Structures* - In accordance with Implementation of the Pennsylvania State History Code: Policy and Procedures for Applicants for DEP Permits and Plan Approvals" (Document No. 012-0700-001), it is the policy of DEP to cooperate with the Pennsylvania Historical and Museum Commission (PHMC) in the preservation, protection, and investigation of significant archaeological resources and historic structures. As such, an alternatives analysis should include the Cultural Resource Notice and the associated information and correspondence with the Pennsylvania State Historic Preservation Office (PA SHPO) as applicable.

e) *Special Protection Waters* – All Commonwealth waters are protected for designated and existing aquatic life use as well as for a number of water supply and recreational uses as defined in Chapter 93. Water Quality Standards. Special protection waters are those with excellent water quality and are classified as Exceptional Value (EV) or High-Quality (HQ). Applicants should consider both the designated and existing uses of waters when selecting their preferred alternative.

f) *Scenic Rivers* - Federal and state legislation allows waterway segments to be designated as part of the Scenic Rivers System. Scenic Rivers legislation (Wild and Scenic Rivers Act of 1968 and Pennsylvania Scenic Rivers Act) is intended to protect the natural, aesthetic, and recreational values of these specially-designated waterways and utilize sound conservation policies and management practices. The protection efforts are largely carried out through a partnership between the Department of Conservation and Natural Resources (DCNR) and other state agencies, whereby construction projects in the vicinity of a designated Scenic River are required to undergo a more rigorous permitting process and may be required to adjust the project design and/or construction practices to ensure that the natural and aesthetic values of the waterway are maintained. (Wild and Scenic Rivers Act of 1968, Section 7; Pennsylvania Scenic Rivers Act, Section 9).

III. ENVIRONMENTAL AND PROJECT-SPECIFIC CONSIDERATIONS

DEP has identified certain types of projects where alternative considerations may vary or only apply in certain situations. DEP may also request a site-specific alternatives analysis if warranted by unique, rare or complex circumstances where typical construction methods or Best Management Practices (BMPs) do not sufficiently ensure protection of public health, safety, or the environment. These potential considerations are listed below by project category. Applicants should read through all of these considerations, as their project may fall under more than one category.

A. Land Development Projects

Land development projects include residential, commercial, industrial, and institutional developments. Impacts to aquatic and sensitive resources via land development projects can be associated with the construction of: buildings, parking lots, storm water control facilities, utility lines, docks, access roads, trails, etc. Both location and design avoidance and minimization alternatives analyses are appropriate for new development sites. The inability to utilize eminent domain in most cases limits some development options. As such, applicants should be proactive in coordinating with local municipalities when developing alternative site designs that avoid and minimize impacts to aquatic and sensitive resources, as it may be practicable to obtain waivers or relief from local

ordinances for a less impactful alternative. In addition, county, state and, federal regulations may limit available development options. Land development sites share common issues but are also somewhat unique in terms of site design, and type and extent of impacts.

Land development sites and the associated variation in their designs can affect aquatic and sensitive resources in various ways. Changing the design or footprint of a land development project can affect: the quality, rate, and volume of runoff conveyed from the development to the receiving body of water; the extent of infrastructure required to accommodate the development; and, depending on the footprint/continuity requirements of the structure or development, the severity of direct impacts to aquatic and sensitive resources.

Examples of land development types include the following:

1. Residential Development – this type of development can have a variety of site designs ranging from high density units with little open-space, to multi-acre lots with extensive open space.

2. Commercial Development – this type of development may need a large/flat footprint which would require more cut/fill and potential impacts to aquatic resources.

3. Industrial Development – this type of development normally requires access to regional roads, rail, and/or waterways.

4. Institutional/Educational Development – these types of developments may involve large areas of land, which typically have a master plan.

B. Linear Utility Projects

A linear utility project is a type of project that, in general, has an elongated shape relative to end points and corridor width. Examples include oil and gas pipelines, waterlines, sanitary sewers, and energy/power transmission lines. Due to their linear nature, these projects may have multiple aquatic and sensitive resource impacts. In addition to the impacts associated with the utility line, impacts of the ancillary features (e.g. temporary work spaces, access roads, valve sites, meter stations, manholes, compressor stations etc.) as well as long-term operation and maintenance needs associated with the project are important considerations that should be incorporated during the development of alternatives analyses.

Typically, the project type will dictate the necessary corridor width, while terrain and local ordinances affect location and alignment or routing. For some utility projects, exercising eminent domain rights is not a viable option for the applicant. Instead, the general route, with respect to the properties affected, is dictated by negotiations with the property owner(s). Although these projects have defined start and endpoints, there is some flexibility in their alignment/routing within and among properties. With respect to co-locating or replacing linear utilities projects within existing ROWs, projects that are fully located within an existing ROW may not warrant a location alternatives analysis. However, projects not fully located within an existing ROW will typically require an offsite alternatives analysis. Some linear projects may include a NEPA assessment, but as noted in Section II. A., a NEPA alternatives analysis does not satisfy the Chapter 105 alternatives analysis.

If the project is regulated by the Federal Energy Regulatory Commission (FERC), the overall route of projects and the associated ROW width are regulated by FERC and are often determined prior to submittal of a Chapter 105 application to DEP. As such, recommendations suggested by the DEP during the application process for alternate locations and utilization of certain BMPs such as reduced right of way width to further protect aquatic and sensitive resources may be difficult to accommodate. The FERC process is selective in authorizing adjustments, reserving such instances where circumstances for further avoidance and minimization of aquatic and sensitive resources is deemed necessary. To address these challenges, DEP strongly recommends early consultation and coordination with state agencies during FERC-filing and other related processes. This early coordination will allow DEP to evaluate and weigh-in on the proposed routing and associated alternatives. As a result, applications later submitted to DEP are less likely to encounter challenging circumstances and, based on the early consultation with DEP, should be designed to have avoided and minimized impacts to aquatic and sensitive resources to the maximum extent practicable.

In addition to the items discussed in Section II. D., "Components of All Alternatives Analyses", there are additional components specific to linear utility projects that warrant additional discussion. This is not intended to be an all-inclusive list, and other considerations may be applicable as dictated by site-specific constraints.

1. *Open Cut vs. Trenchless Technologies* – In circumstances when an open cut method is the preferred alternative to trenchless technology methods (e.g. conventional boring, HDD) reasoning should be included in the alternatives analysis regarding this choice. If this reason includes construction cost, refer to Section II. D. 4., "Construction Cost", of this document. Applicants should refer to DEP's Trenchless Technology Technical Guidance Document (Document No. 310-2100-XXX) for additional information regarding this technology type.

2. *Special Protection Waters* – It is strongly recommended that trenchless technology alternatives be considered if the project crosses special protection waters, including EV wetlands, when it is the least impactful alternative. Regardless of technologies utilized to cross these waters, preservation of existing forested riparian buffers and forested steep slopes associated with the special protection resources should be considered and implemented.

3. *Mosaics and Multiple Resource Crossings* – There may be instances when a linear utility line project encounters a mosaic or multiple aquatic and sensitive resources in a concentrated area. In these circumstances, applicants should attempt to adjust the project alignment to avoid the largest number of resources. In addition, design avoidance and minimization alternatives that will result in the least amount of impact, such as trenchless technologies, should always be considered.

4. *Right of Way Reduction* – Reduction of the ROW through aquatic and sensitive resources should always be considered as part of design avoidance and minimization. In addition, efforts should made to avoid and minimize the placement of temporary workspaces within all aquatic and sensitive resources.

5. *Co-location* – Co-location involves installation of a new facility either within an existing ROW corridor, or adjacent to an existing ROW corridor. These ROWs could include existing pipeline, overhead electrical, and roadway corridors. Applicants should consider use of existing maintained or active ROWs over unmaintained ROWs as an alternative whenever possible and should attempt to locate ancillary features, such as temporary work spaces, in active ROWs. Applicants are encouraged to work with other operators and entities to share ROWs and thereby maximize co-location capabilities.

C. Transportation Projects

Transportation projects cover a wide range of activities that include roadways, highways, bridges, culverts, rail lines, airports, ports, rest areas, bus routes, bike lanes, walking paths and other associated support facilities. As with linear projects, some transportation projects may include a NEPA assessment, but as noted in Section II. A., a NEPA alternatives analysis does not satisfy the Chapter 105 alternatives analysis. Many of these projects are constructed out of necessity to improve safety, accessibility, and mobility for the public. Although their functions are varied, transportation projects generally fall into one of the following three categories:

1. New Alignments & Facilities – Both a location and a design avoidance and minimization alternatives analysis is anticipated for these project types. If the NEPA process is applicable, the location analysis should be correlated to the NEPA document. If the NEPA process is not applicable, the summation impacts for each of the alternative location alignments should be documented and justification should be provided for the preferred alignment. In addition, individual activities impacting aquatic and sensitive resources for the preferred alternative should be avoided and minimized.

2. Existing Alignments & Facility Expansions – A location alternatives analysis may be required for these types of projects depending on the project purpose, scope, and associated impacts to aquatic and sensitive resources. Impacts to aquatic and sensitive resources should be avoided and minimized to the extent practicable regardless of project or permit type.

3. Bridge or Culvert Replacement & Restoration – A location alternatives analysis is not anticipated for these types of projects. Impacts to Regulated Waters of the Commonwealth must be avoided and minimized to the extent practicable regardless of whether or not the activity qualifies for a waiver or general permit.

D. Restoration and Pollution Abatement Projects

Restoration and pollution abatement projects cover a wide range of activities that include, but are not limited to, restoration of aquatic resources, abandoned mine reclamation, acid mine drainage treatment, and brownfields. The intent of many restoration and pollution abatement projects is the restoration or creation of an aquatic resource, or the abatement of an environmental or health and safety concern. Since restoration and pollution abatement projects are intended to mitigate a site-specific issue, typically a detailed location alternatives analysis is not necessary for these types of projects given their nature and intended purpose. However, design avoidance and minimization alternatives for restoration and pollution abatement projects should still be considered to avoid and minimize aquatic and sensitive resource impacts. It is strongly recommended that applicants reach out to DEP during the pre-application process regarding these types of projects.

Due to the unique nature of aquatic resource restoration and current program development efforts, readers of this guidance document are directed to the "Restoration Environmental Assessment Form" and associated instructions which are being developed to specifically address activities related to this category of project. Further information about the Restoration EA can be found on DEP's website or by contacting the Bureau of Waterways Engineering and Wetlands at (717) 787-3411. For the purposes of this guidance document, compensatory mitigation related to unavoidable aquatic resource impacts is not considered a restoration and pollution abatement project. Proposed compensatory mitigation should be detailed, as applicable, in the mitigation plan that is submitted with the Chapter 105 permit application as a separate document/attachment.

IV. ALTERNATIVES ANALYSIS PROCESS & TEMPLATE OF ITEMS TO SUBMIT TO THE DEP

This process description and template checklist provide a framework for evaluating alternatives pursuant to 25 Pa. Code Sections 105.13(e)(1)(iii),105.13(e)(1)(viii), 105.14(b)(7), 105.18a(a)(3) and 105.18a(b)(3) and offers guidance regarding what should be submitted to DEP. These are not intended to be stand-alone documents. Instead, this process description and template checklist should be considered companions of the AA TGD and should not be utilized without proper examination of the referenced guidance. Prior to utilizing the following checklist, it is strongly recommended that all sections of the AA TGD are read thoroughly.

A. Alternatives Analysis Process

As referenced throughout this TGD, alternatives analyses are expected to be commensurate with project impacts. The analysis should be prepared by individuals with appropriate experience, education, training, and local knowledge and familiarity with both state and federal regulations. Applicants preparing an AA should document and justify the proposed impacts to aquatic and sensitive resources and demonstrate that those impacts have been first, avoided, and second, minimized. The AA process should begin during the initial project planning phase such as when property acquisition is under consideration. It is not appropriate to begin exploring alternatives during the permit application phase as the analysis is being prepared. In addition, it is the responsibility of the applicant to prepare and present a thoroughly vetted and defensible AA to the DEP.

It is recommended that initial assessments of properties for anticipated impacts to aquatic and sensitive resources occur during the "due diligence" phase of project planning. Project constraints associated with the aquatic and sensitive resources to be impacted, such as those discussed in Sections II and III of this guidance document should be understood and incorporated into project planning.

It may not be possible to field-delineate all Regulated Waters of this Commonwealth along alternative routes or at alternative land parcels during the location alternative analysis process. As mentioned in Section II.D.1. of this guidance document, the approximate locations of many watercourses and wetlands can be identified using a variety of data available from several digital mapping resources, however, it must be recognized that such mapping resources are not meant to be precise and can be inaccurate due to the limitations of the data collection method(s). See Section VI, Part B of this guidance document for a list of resources that may be useful.

After location alternatives have been explored and appropriate site(s) selected, the applicant should complete a full delineation of the aquatic and sensitive resources. Applicants should not solely rely upon desktop resources for identifying wetlands, streams, and other

aquatic resources during the design avoidance and minimization alternatives analysis. Rather, a field delineation of all Regulated Waters of this Commonwealth, including wetlands, must be conducted. A Preliminary Jurisdictional Determination (PJD) from the Army Corps of Engineers may be beneficial to confirm the accuracy of the delineations. The design avoidance and minimization analysis should evaluate the potential direct and indirect environmental effects of the proposed project. Factors such as site re-design and layouts, including green infrastructure design options for structures and storm water management (e.g. enhanced riparian areas, rain gardens, pervious pavement, green roofs, bioswales, etc.), should be assessed and documented as part of the avoidance and minimization of impacts to aquatic and sensitive resources.

It is important to remember that if avoidance and minimization of aquatic and sensitive resource impacts is not practicable due to issues such as protection of public health and safety, pollution abatement, and/or economic factors, the applicant must accurately assess and present these issues in the alternatives analysis.

B. Template of Items to Submit to the Department

☐			**Water Dependency / Purpose Narrative** – This narrative should be contained within the project description. See Environmental Assessment Instructions for more information.
☐			**Location Alternatives Narrative and Tables** – Detailing the preferred and alternate location(s). This narrative should discuss and quantify the environmental impacts and detail site constraints associated with each of the proposed offsite alternatives. See Tables 3a-c in Section IV.C. for an example offsite summary table.
	☐		**Selected Location Description –** Justification for selection of the preferred alternative should be provided. This description should include the following:
		☐	**Aquatic Resource Impact(s) Description -** Impacts to aquatic resources should be detailed and quantified for the selected alternative. This effort should be completed for all sensitive and aquatic resources (as defined in this TGD) impacted by the project. Applicants should include information regarding resource type and impact acreage, square feet, or linear feet (as appropriate).
		☐	**Other Environmental Considerations –** Environmental policies and other factors that influenced the selection of the chosen location should be discussed.
		☐	**Project Specific Factors** – Siting, design, or construction feasibility considerations specific to the proposed project that influenced the selection of the preferred offsite alternative should be discussed.
		☐	**Future Impacts** – Reasonably foreseeable potential future impacts to aquatic and sensitive resources, if applicable, of the chosen alternative location.
	☐		**Considered Alternate Location(s) Description(s) –** Alternative locations not utilized or selected should be described and compared. This narrative should include a discussion of environmental impacts and site constraints associated with each offsite alternative. The discussion should detail how aquatic resources were identified for the offsite alternatives (e.g. identify which desktop resources were used) and should quantify the impacts to aquatic and sensitive resources associated with each alternative. If an alternative location has less environmental impacts than the chosen location, a detailed justification of why the least environmentally impactful alternative is not practicable should be provided.

☐	**Design Avoidance and Minimization Alternatives Narrative and Tables** – Detailing the preferred and alternate design(s). This narrative should discuss avoidance and minimization efforts in addition to detailing site constraints associated with each of the proposed alternatives. See Tables 4a-c in Section IV.C for an example onsite summary table.		
	☐	**Selected Design Alternative -** Justification for selection of the preferred alternative should be provided.	
		☐	**Aquatic Resource Impact(s) Description**- With aquatic and sensitive resources identified and field-delineated for the site, applicants should detail and compare the resource impacts and site constraints associated with each onsite (design) alternative. This effort should be completed for all sensitive and aquatic resources (as defined in this TGD) impacted by the project. Applicants should include information regarding resource type and impact acreage, square feet, or linear feet (as appropriate).
		☐	**Other Environmental Considerations –** Environmental policies and other factors that influenced the selection of the chosen design.
		☐	**Project Specific Factors** – Siting, design, or construction feasibility considerations specific to the proposed project that influenced the selection of the preferred design alternative.
		☐	**Future Impacts** - Reasonably foreseeable potential future impacts, if applicable, for each alternative
	☐	**Considered Design Avoidance and Minimization Alternatives Description –** Alternative designs considered but not utilized or selected should be described. If an alternative has less environmental impacts than the proposed alternative, a detailed explanation that takes into consideration construction cost, existing technology, and logistics of why the alternative is not practicable should be provided.	
☐	**Location and Design Avoidance and Minimization Alternatives Exhibits –** Include pertinent exhibits (e.g. maps, drawings, standard details, etc.) that depict the proposed impacts to aquatic and sensitive resources (e.g. crossings, cut/fill, excavations, etc.), for all offsite and onsite alternatives. Drawings and/or maps should include specific details regarding layout, design, and crossing methodologies. If these files are subject to the "Protected Critical Infrastructure Information (PCII) Program" and should not be made available to the public, appropriate documentation must be submitted to the Department in order for the files to be considered confidential.		
☐	**Data Resources** – List of data resources utilized		

C. Example Location and Design Avoidance and Minimization Alternatives Analysis Summary Tables

The following tables are examples of what could be submitted to the Department as a supplement to the alternatives analysis narrative. Due to the unique nature of different project types, applicants should modify these example tables to include pertinent information as appropriate. These tables should succinctly describe both the location alternatives and design avoidance and minimization alternatives evaluated during the project planning process. These tables should not be used as a surrogate for the alternatives analysis narrative.

1. Location Alternatives Summary Table – A location alternatives summary table should include information regarding sites both owned and not owned by the applicant which could reasonably be obtained, utilized, expanded or managed to fulfill the basic purpose of the proposed project. If the project is linear in nature (e.g. utility line or pipeline), this table could summarize alternative routes evaluated during project planning. If the project is related to land development (e.g. residential or commercial development), this table could detail different parcels evaluated during the planning process.

Table 3a. Example Location Alternatives Summary Table – Transportation Project

Alternatives ‡	Description	Preferred Alternative? (Y/N)	Summary of Aquatic Resource Impacts	Practicability Rationale*
Alternative # 1	*Route A: Route highway through a mountain - Requires building a tunnel and blasting. No impacts to aquatic resources.*	*N*	*None*	*Construction cost, concerning geology, hazardous construction.*
Alternative # 2	*Route B: Route highway along river. 45% forested, 25% Other PEM/PSS wetlands, 30% meadow/herbaceous.*	*N*	*2.0 ac of Other PEM wetland, 0.1 ac of floodway, 1.0 ac of floodplain impacts*	*Increased impacts to floodway, floodplain, and wetlands, increased forest clearing.*
Alternative # 3	*Route C: Invoke eminant domain and route highway along edge of populated area. 65% urban, 5% EV wetlands, 20% forested, 10% meadow/open field.*	*Y*	*5,000 sf of floodway impacts, 0.5 ac of EV PEM wetland impacts*	*Preferred alternative - avoids and minimizes impacts to aquatic resources to the extent practicable.*

‡ Additional alternatives summary rows should be added as necessary
* e.g. construction cost, existing technology, logistics and items listed in §105.14(b)

Table 3b. Example Location Alternatives Summary Table – Linear Utility Project

Alternatives ‡	Description	Preferred Alternative? (Y/N)	Summary of Aquatic Resource Impacts	Practicability Rationale*
Alternative # 1	*Alignment A: ROW primarily routed through undeveloped properties; 60% forested, 15% EV PSS wetlands, 15% meadow/open field, 10% urban; located along floodway of HQ water*	*N*	*3.0 acres EV PSS wetland impacts; 9,000 sf of floodway impacts*	*Property owner issues, T&E spp. Concerns; increased impacts to wetlands, forested areas, and floodway.*
Alternative # 2	*Alignment B: ROW primarily collocated with existing utility; 15% forested, 10% Other PEM wetlands, 75% meadow/open field (maintained ROW)*	*Y*	*1,000 sf of floodplain impacts, 0.3 ac Other PEM wetland impacts*	*Preferred alternative - avoids and minimizes impacts to aquatic resources to the extent practicable.*
Alternative # 3	*Alignment C: ROW primarily routed through agricultural fields; 80% agricultural field, 10% forested, 10% urban*	*N*	*None*	*Property owner issues, prime farmland concerns.*

‡ Additional alternatives summary rows should be added as necessary
* e.g. construction cost, existing technology, logistics and items listed in §105.14(b)

Table 3c. Example Location Alternatives Summary Table – Land Development Project

Alternatives ‡	Description	Preferred Alternative? (Y/N)	Summary of Aquatic Resource Impacts	Practicability Rationale*
Alternative # 1	*Parcel A: Undeveloped property; 75% forested, 25% meadow; located within floodway of HQ water*	*N*	*500 LF of HQ stream impacts; 2,500 sf of floodway impacts*	*Construction cost, T&E spp. Concerns, increased impacts to forested areas and waterways.*
Alternative # 2	*Parcel B: Brownfield site remediated for PCBs; 70% open field, 5% (2.0 ac) Other PEM wetlands, 25% asphalt*	*N*	*0.5 ac Other PEM wetland impacts*	*Contamination concerns, increased impacts to wetlands.*
Alternative # 3	*Parcel C: 98% Old agricultural field, located within floodplain of trout natural reproduction water, 2% (0.5 ac) EV PEM wetlands onsite*	*Y*	*1,000 sf of floodplain impacts, 500 sf of floodway impacts*	*Preferred alternative - avoids and minimizes impacts to aquatic resources to the extent practicable.*

‡ Additional alternatives summary rows should be added as necessary

* e.g. construction cost, existing technology, logistics and items listed in §105.14(b)

2. Design Avoidance and Minimization Alternatives Summary Table – A design avoidance and minimization alternatives summary table should include information regarding alternative onsite designs, routings, layouts and engineering and construction techniques. For example, if the project is linear in nature (e.g. utility line or pipeline), this table could summarize the feasibility of crossing aquatic resources utilizing open-cut and trenchless technologies. If the project is transportation related (e.g. bridge or culvert installation or replacement), this table could summarize the different structure types evaluated during the planning process.

Table 4a. Example Design Avoidance and Minimization Alternatives Summary Table – Transportation Project

Resource Information					Alternatives ‡								
Resource					Alternative #1			Alternative #2			Alternative #3		
Unique Resouce Identifier	Aquatic Resource Type	Waters Name	PA Code Chapter 93 / 105 Classification†	Resource Narrative Description	Cumulative Resource Impact	Chosen Alternative?	Practicability Rationale*	Cumulative Resource Impact	Chosen Alternative?	Practicability Rationale*	Cumulative Resource Impact	Chosen Alternative?	Practicability Rationale*
ST023	*Perennial Stream*	*Adams Run*	*EV*	*pg. 13 EA*	*Bottom-less arch*			*20" Culvert*			*Bridge*		
					100 Square Feet	*No*	*pg. 3 Alt Analysis*	*110 Square Feet*	*Yes*	*pg. 3 Alt Analysis*	*60 Square Feet*	*No*	*Cost; pg 13 Alt Analysis*

‡ Additional alternatives summary columns should be added as necessary

† Stream designated / existing use per Chapter 93, Wetland designation per Chapter 105

* e.g. construction cost, existing technology, logistics and items listed in §105.14(b)

Table 4b. Example Design Avoidance and Minimization Alternatives Summary Table – Linear Utility Project

Resource Information					Alternatives ‡								
Resource					Alternative #1			Alternative #2			Alternative #3		
Unique Resouce Identifier	Aquatic Resource Type	Waters Name	PA Code Chapter 93 / 105 Classification†	Resource Narrative Description	Cumulative Resource Impact	Chosen Alternative?	Practicability Rationale*	Cumulative Resource Impact	Chosen Alternative?	Practicability Rationale*	Cumulative Resource Impact	Chosen Alternative?	Practicability Rationale*
W-001	*PFO Wetland*	*-*	*Other*	*pg. 27 EA*	*Open-Cut Trench*			*Conventional Bore Trenchless Technology*			*HDD Trenchless Technology*		
					250 Linear Feet	*Yes*	*pg. 3 Alt Analysis*	*25 Linear Feet*	*No*	*Unsuitable geology; Pg 3 Alt Analysis*	*25 Linear Feet*	*No*	*Cost; pg 5 Alt Analysis*

‡ Additional alternatives summary columns should be added as necessary

† Stream designated / existing use per Chapter 93, Wetland designation per Chapter 105

* e.g. construction cost, existing technology, logistics and items listed in §105.14(b)

Table 4c. Example Design Avoidance and Minimization Alternatives Summary Table – Land Development Project

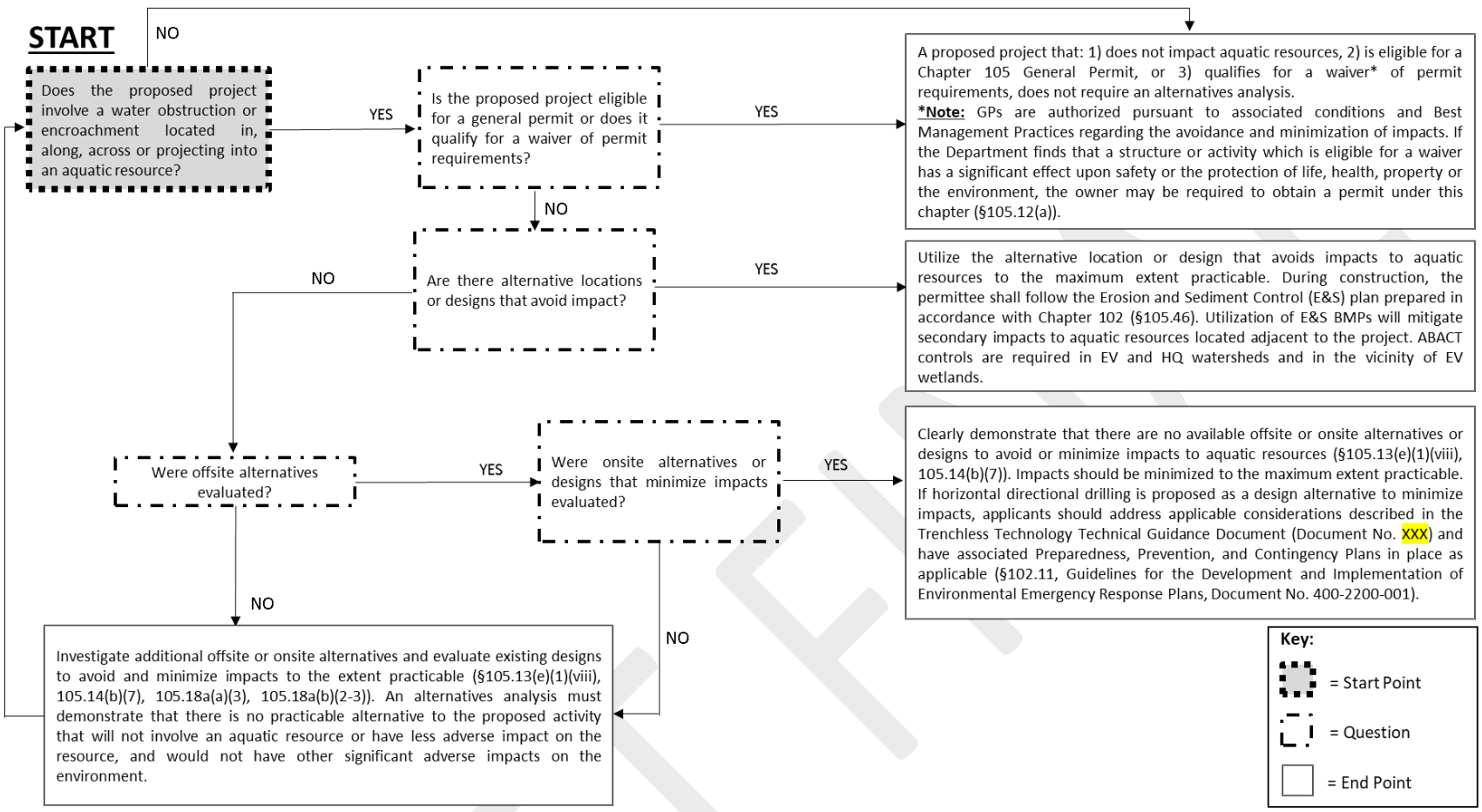
Resource Information					Alternatives ‡								
Resource					Alternative #1			Alternative #2			Alternative #3		
Unique Resouce Identifier	Aquatic Resource Type	Waters Name	PA Code Chapter 93 / 105 Classification†	Resource Narrative Description	Cumulative Resource Impact	Chosen Alternative?	Practicability Rationale*	Cumulative Resource Impact	Chosen Alternative?	Practicability Rationale*	Cumulative Resource Impact	Chosen Alternative?	Practicability Rationale*
W-002	*PEM Wetland*		*EV*	*pg. 35 EA*	*Configuration A*			*Configuration B*			*Configuration C*		
					0.35 ac.	*No*	*Cost/Increased impacts; pg. 4 Alt. Analysis*	*0.20 ac.*	*No*	*Increased impacts; pg. 7 Alt. Analysis*	*0.15 ac.*	*Yes*	*pg. 2 Alt. Analysis*

‡ Additional alternatives summary columns should be added as necessary

† Stream designated / existing use per Chapter 93, Wetland designation per Chapter 105

* e.g. construction cost, existing technology, logistics and items listed in §105.14(b)

D. Flowchart for Evaluating Project Alternatives



V. REFERENCES

25 PA Code Chapter 105. Dam Safety and Waterway Management
https://www.pacode.com/secure/data/025/chapter105/chap105toc.html

40 CFR Part 230- Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material
https://www.nap.usace.army.mil/Portals/39/docs/regulatory/regs/40cfr230.pdf

Commonwealth of Virginia DEQ "Guidance Memorandum Number 04-2007 Avoidance & Minimization of Impacts to Surface Waters." Feb. 6, 2004.
https://www.deq.virginia.gov/Portals/0/DEQ/Water/Guidance/042007.pdf

Comprehensive Environmental Assessment (CEA) of Proposed Project Impacts for Chapter 105 Water Obstruction and Encroachment Permit Applications; and Comment and Response Document. Document No. 310-2137-006 & 310-2137-006 CR
http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4679

DEP Environmental Assessment Form and Instructions (Document No. 3150-PM-BWEW0017)
http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4048

Draft ASTM Standard for Good & Customary Practice for Evaluating Practicable Alternatives Under the Clean Water Act Section 404 Program. August 12, 1999. https://www.hklaw.com/publications/proposed-astm-standard-for-good-and-customary-practice-in-evaluating-practicable-alternatives-for-wetlands-permitting-09-01-1999/?nomobile=perm

EPA Memorandum: Appropriate Level of Analysis Required for Evaluating Compliance with the Section 404(b)(1) Guidelines Alternatives Requirements
https://www.epa.gov/cwa-404/memorandum-appropriate-level-analysis-required-evaluating-compliance-section-404b1

EPA Memorandum: Individual Permit Flexibility for Small Landowners
https://www.epa.gov/cwa-404/memorandum-individual-permit-flexibility-small-landowners

Final Guidance - Substantive Revision Agricultural Land Preservation Policy (Document No. 012-0700-002)
https://www.dep.state.pa.us/hosting/growingsmarter/012-0700-002%5B2%5D.pdf

Pennsylvania Department of Environmental Protection: Erosion and Sediment Pollution Control Program Manual, March 2012 (Technical Guidance 363-2134-008). http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4680

Policy for Pennsylvania Natural Diversity Inventory (PNDI) Coordination During Permit Review and Evaluation (Document No. 021-0200-001)
http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4637

The Federal Wetland Permitting Program: Avoidance and Minimization Requirements, Environmental Law Institute, March 2008
https://www.lrl.usace.army.mil/Portals/64/docs/regulatory/Permitting/ELI.pdf

US Army Corps of Engineers: Corps of Engineers Wetlands Delineation Manual. January 1987 – Final Report.
https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/4532/

VI. APPENDICES

A. NEPA vs. Chapter 105 Alternatives Analyses

Due to similarities in commonly used terms for environmental analysis and permitting, it is necessary in this document to describe the differences between an alternatives analysis following "NEPA" versus one following "Ch. 105".

Environmental Assessment (EA) can be defined as –

1. An exploratory report under NEPA, that is prepared for environmental clearance when the significance of impacts is not clearly known. An EA provides the analysis and documentation to determine whether an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) should be prepared.
2. A section of the DEP Joint Permit Application that presents the potential impacts on the physical, chemical, and biological characteristics of the aquatic ecosystems and Special Aquatic Sites in the project area.

The National Environmental Policy Act (NEPA) is a federal law enacted on January 1, 1970. 42 U.S.C. §§ 4321-4347. NEPA requires federal agencies to assess the environmental effects of their proposed actions prior to making decisions. The range of actions covered by NEPA is broad and includes making decisions on permit applications, adopting federal land management actions, and constructing highways and other publicly-owned facilities. Using the NEPA process, agencies evaluate the environmental and related social and economic effects of their proposed actions. This evaluation includes looking at an equally broad alternatives analysis which goes beyond impacts to aquatic resources. **Source:** https://www.epa.gov/nepa/what-national-environmental-policy-act

The NEPA process begins when a federal agency develops a proposal to take a major federal action or proposes to use federal funding. These actions are defined at 40 CFR 1508.18. The environmental review process under NEPA can involve three different levels of analysis, listed here from least to most complex: Categorical Exclusion determination (CATEX), Environmental Assessment/Finding of No Significant Impact (EA/FONSI), Environmental Impact Statement (EIS). **Source:** https://www.epa.gov/nepa/national-environmental-policy-act-review-process

In comparison, the Dam Safety and Encroachments Act and its companion 25 Pa. Code Chapter 105 regulations is narrower in scope and applies almost exclusively[1] to water obstructions and encroachments focusing on impacts to aquatic resources. To further understand this, one needs only to examine the definitions in 25 Pa. Code § 105.1, where water obstruction is defined as: (i) A dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment or other structure located in, along or across or projecting into a watercourse, floodway or body of water; (ii) In the case of ponds, lakes and reservoirs, a water obstruction is considered to be in or along the body of water if, at normal pool elevation, the water obstruction is either in the water or adjacent to and abutting the water's edge. An encroachment is defined as: A structure or activity which changes, expands or diminishes the course, current or cross section of a watercourse, floodway or body of water.

The definitions associated with the NEPA process, while similar, are also quite different and do not supersede or nullify those found in Chapter 105, which were promulgated under the DSEA and CSL. With that said, information from an alternatives analysis prepared to satisfy NEPA can be used to help satisfy certain aspects of an alternatives analysis for Ch. 105.

[1] Ch. 105 also applies to dams which are specialized in nature and are not subject to this guidance document.

B. Data Resource List

This appendix provides a list of data resources that may be helpful in an applicant's investigation and analysis. This is not a complete list of resources. An incomplete investigation and analysis of information necessary for the adequate review of the project may impede the permit review process.

Formatting Key:
Bold, Black Underline – Name of Data Resource
Bold – Sub-category name of data resource
Blue underline – Hyperlink to data resource (if available)
(Parenthesis) / Black Underline / *Italics* – (General listing of available data) / Major data categories / *Sub-categories*

- **Municipality / Township and County Websites and Contact** (Aerials, Topography, Tax / Parcel, Plats, Easements, Deed information, Hydrology, Hydrogeology, Manmade features, Geologic, Soil, Site specific impediments, Sewage service areas, private septic systems). Note: Township has contact information for sewage utility to obtain sewage service areas. Township Sewage Enforcement Officers keep records of private septic systems, though older systems may lack any record.
- **United States Geological Survey (USGS)**
  - **Earth Explorer (EE)** - https://earthexplorer.usgs.gov/ (Aerials, LIDAR / DEMS, Historic manmade features, Historic and current land uses)
  - **Historical Topographic Map Explorer (HT)** - http://historicalmaps.arcgis.com/usgs/ (Historic topography, Historic manmade features, Historic and current land use)
  - **National Geologic Map Database (NGMDB) and Association of American State Geologist (AASG)** - https://ngmdb.usgs.gov/ngmdb/ngmdb_home.html (Geologic overview, Strike and dip, Fractures and faults, Karst, Subsurface voids, Caves, Subsidence features)
  - **Pennsylvania Water Science Center** - https://pa.water.usgs.gov/infodata/groundwater.php (Groundwater, Groundwater table, Well and spring locations)
- **National Water Quality Monitoring Council** - https://www.waterqualitydata.us/portal/ (Groundwater table, Well and spring locations, USGS well water supply sampling)
- **Unites States Department of Agriculture Natural Resources Conservation Service (USDA)**
  - **Web Soil Survey** - https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm (Soil interfaces and unconsolidated material, Soil characteristics and properties)
- **U.S. Fish and Wildlife Services (FWS)**
  - **FWS** - https://www.fws.gov/gis/data/national/ (Critical habitat, Regional boundaries)
  - **National Wetland Inventory (NWI)** - https://www.fws.gov/wetlands/ (Wetlands)
- **Federal Emergency Management Act (FEMA)**
  - **National Flood Hazard Layer (NFHL)** - https://catalog.data.gov/dataset/national-flood-hazard-layer-nfhl (Floodway, Floodplain)
  - **NFHL Viewer** - https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd (Floodway, Floodplain)
- **Pennsylvania Spatial Data Access (PASDA)**
  - **PASDA** - https://www.pasda.psu.edu/ (Aerials; LIDAR / DEM; Topography; County boundaries; Municipalities; Tax / Parcel information; Rivers; Streams; Wetlands: *FWS NWI Wetlands, Modeled primary wetlands Commonwealth of Pennsylvania Statewide 2013, Modeled restorable wetlands Commonwealth of Pennsylvania Statewide 2013*; Springs; Geologic overview; Soil interfaces; Note 1: PASDA does not include all County or Municipality or Tax / Parcel boundary data in PA, if data is not listed on PASDA check specific County or Municipality website and/or contact. Note 2: PA DEP public records search to obtain soil and groundwater contamination area delineations.
- **Pennsylvania Imagery Navigator (PSIEE)** – https://maps.psiee.psu.edu/ImageryNavigator/ (Aerials – Limited areas of PA, LiDAR contours, Topography)
- **Pennsylvania Department of Conservation & Natural Resources (DCNR)** – https://www.dcnr.pa.gov/Pages/default.aspx or http://data-dcnr.opendata.arcgis.com/
  - **Pennsylvania GEOlogic Data Exploration (PaGEODE)** – http://www.gis.dcnr.state.pa.us// (Topography, Groundwater, Groundwater table, Geologic overview, Geologic mapping, Strike and dip, Formation identification, Fractures / Faults, Subsurface voids, Karst, Caves, Subsidence features, Wells and springs)

- ❒ **Open Data Portal** – http://data-dcnr.opendata.arcgis.com/ (Aerials, DEM / LIDAR, Groundwater, Groundwater table, Geologic overview, Geologic mapping, Formation identification, Fractures / Faults, Soil interfaces and geologic contacts, Subsurface voids, Karst, Caves, Subsidence features, Unconsolidated material)
- ❒ **Pennsylvania Groundwater Information System (PAGWIS)** – https://www.dcnr.pa.gov/Conservation/Water/Groundwater/PAGroundwaterInformationSystem/Pages/default.aspx (Well and spring locations, Private well supply locations, Well construction, Groundwater table)

- **Department of Environmental Protection (DEP)** – https://www.dep.pa.gov/Pages/default.aspx and https://www.dep.pa.gov/DataandTools/Pages/GIS.aspx
  - ❒ **eMapPA** – http://www.depgis.state.pa.us/emappa/ (Web application for interactive mapping of: Complaints; Federal EPA sites; Regulated facilities and related information: *Air, Land reuse, Mining, Oil and gas, Radiation, Sample information system, Streams and water resources, Storage tanks, Waste, Water including public water service areas and public supply well listings;* Areas POI – geological; Areas POI – Environmental; Areas POI – General; Boundaries)
  - ❒ **DEP Environmental Site Assessment Search Tool** - https://www.depgis.state.pa.us/esaSearch/ (Web application for interactive mapping of: Air emissions, Known contamination, Surface and deep mines, Known oil and gas wells, and related subcategories) Note: Data layers available for download on PASDA or DEP OPEN DATA.
  - ❒ **DEP Activity and Use Limitations Registry (AUL)** - http://www.depgis.state.pa.us/pa-aul/ (Activity and use limitations: including not limited to Fencing, Groundwater use prohibition, Groundwater treatment, Health and safety plan, Leachate collection system, Maintenance of cap, Municipal ordinance, Non-residential use, Other engineering control, Other institutional control, Maintenance of point-of-entry treatment systems, Slab on grade construction, Slurry wall, Soil management, Stormwater management, Vapor barrier, Vapor mitigation, Vapor investigation, Groundwater use monitoring) Note: PA AUL provides direct links to AUL documents associated with a particular property (Document examples: Administrative Orders, EPA Consent Decrees, Consent Orders and Agreements, Deed restrictions, Environmental Covenants, Military master plans, Municipal ordinances, Post-remediation care plans)
- **Pennsylvania Historical & Museum Commission** - http://www.phmc.state.pa.us/bah/dam/rg/di/r17-114CopiedSurveyBooks/r17-114MainInterfacePage.htm (Surveyed drawing - shows the name of the individual for whom the tract was surveyed, the acreage, the courses and distances and the names of adjoining property owners, and occasionally other significant geographical features of the landscape) Note: Not all parcels in Pennsylvania are included.
- **Pennsylvania Utility Commission (PUC)** - http://www.puc.state.pa.us/ (Existing utilities PA one call and survey markings and/or contact PUC for data)
- **Pennsylvania Department of Transportation (PennDOT)**
  - ❒ **General Site** - https://www.penndot.gov/Pages/default.aspx (Municipalities, Tax / Parcel Information in PDF or contact for GIS or CAD layers)
  - ❒ **Open Portal for GIS data download** - https://data-pennshare.opendata.arcgis.com/ (Manmade features and cultural / architectural features)
  - ❒ **PennDOT online map viewer** - https://www.dot7.state.pa.us/onemap/
- **Delaware River Basin Commission** –
  - ❒ **DRBC GIS** - https://www.state.nj.us/drbc/basin/map/GIS.html (Municipalities, Water resources, Geologic overview, Rivers, Streams, Wetlands)
  - ❒ **DRBC SE PA Ground Water Protected Area GIS** - https://www.nj.gov/drbc/programs/project/pr/gwpa-data.html (Municipalities, Water resources, Geologic overview, Rivers, Streams, Wetlands)
- **Susquehanna River Basin Commission** –
  - ❒ **SRBC Map Viewer** - https://www.srbc.net/portals/susquehanna-atlas/projects-map/ (Municipalities, Water resources, Geologic overview, Rivers, Streams, Wetlands)
  - ❒ **SRBC Data Request** - https://services.srbc.net/request-data/ ($, surface water and groundwater withdrawals, consumptive use facilities, oil and gas) Note: PASDA has search tool and offers a subset of data layers for download for free.
- **Environmental Protection Agency** -
  - ❒ **Operating Procedure – Groundwater Sampling (3/6/2013)** - https://www.epa.gov/sites/production/files/2015-06/documents/Groundwater-Sampling.pdf
- **U.S. Office of Surface Mining Reclamation and Enforcement** -
  - ❒ **Well Purging Procedures for Obtaining Valid Water Samples from Domestic and Monitoring Wells (5/21/2012)** - https://www.arcc.osmre.gov/about/techDisciplines/hydrology/docs/techGuidance/2012/tsd-wggb-Well_Purging.pdf
- **National Wetland Inventory** - https://www.fws.gov/wetlands/

- **Pennsylvania Groundwater Information System (PaGWIS)** - https://www.dcnr.pa.gov/Conservation/Water/Groundwater/PAGroundwaterInformationSystem/Pages/default.aspx