

Alternatives and Justification Analyses Guide

Drainage Features

1.0 Introduction

One of the goals of the Office of Coastal Management (OCM) is to achieve a balance between conservation of coastal resources and development of the coastal zone. Development in the coastal zone is encouraged but avoidance of unnecessary impacts to coastal resources is essential in order to protect those resources for future generations. To accomplish this goal, OCM reviews every Coastal Use Permit (CUP) application with the objective of avoiding and/or minimizing adverse impacts wherever possible. Pursuant to La. RS 49:214.27.B and C., OCM uses the Coastal Use Guidelines, found in LAC Title 43, Part I, Chapter 7, Subpart B, §701-719, to determine the type of information needed to fully evaluate a particular use and the adverse impacts that must be avoided to the maximum extent practicable. All coastal uses must be in conformance with all applicable Coastal Use Guidelines in order to receive approval from OCM.

Part of these guidelines, §701.H, charges OCM with ensuring that the public benefits of a proposed coastal use clearly outweigh any adverse impacts to public resources resulting from that use. **Public benefits** include providing goods and/or services to users that currently do not have reasonable access to such goods and/or services, increasing permanent employment opportunities and increasing public revenues. **Coastal resources** include coastal waters, wetlands, fisheries, wildlife and unique ecological/coastal features such as ridges, cheniers, salt domes, reefs, beaches and dunes. These resources provide value to the public in the form of storm and flood protection, nursery grounds for commercial and recreational fisheries, critical habitat for endangered species and improved water quality. Public resources also include existing structures and infrastructure. **Adverse impacts** are direct or indirect loss and/or negative alteration of a public resource as well as negative impact on concurrent and neighboring coastal users and include such things as increased intensity or frequency of flooding, accelerated erosion and salt water intrusion.

Review of a proposed coastal use using the Coastal Use Guidelines includes asking questions such as:

1. Can adverse impacts from a proposed use on coastal resources and/or user groups be avoided by moving the use to an area which results in less adverse impact to coastal resources and/or users?
2. If the use cannot be moved, can demand for the proposed goods and/or services in the area to which they will be introduced be documented?
3. If a use cannot be moved and demand can be demonstrated, can the use be redesigned/reconfigured, or can different methods be used to accomplish the use, which results in less damage to coastal resources?

To answer these questions, OCM requires that the applicant provide Alternatives and Justification Analyses in sufficient detail to demonstrate a thorough consideration of the respective subjects. In an effort to recognize the differences between small and large projects,

and/or low and high coastal resource impact projects, OCM has developed a tiered approach to Analysis development. Factors such as, but not limited to, the complexity of the development, surrounding land use, type and level of resource impact and coastal use objective(s) are used to determine the range of alternatives to be considered in the Alternatives Analysis and the information and level of detail required for the Justification Analysis. This guide was developed to assist applicants for Coastal Use Permits with determining, in general, the type of information and level of detail needed to fully evaluate a proposed coastal use's potential impacts and benefits and therefore it's conformance with the Coastal Use Guidelines.

To fully evaluate a proposed coastal use's benefits and impacts, Alternatives and/or Justification Analyses are required during review of a use from which adverse impacts to coastal resources are, in OCM's opinion, likely to occur. The Alternatives Analysis should address several options for project siting that are compared equally for feasibility and will allow OCM to determine the least damaging feasible site for the proposed use. The Alternatives Analysis should provide documentation that clearly demonstrates that reasonable efforts were made to find less damaging sites and should provide an explanation for why each less damaging site was not feasible. The Alternatives Analysis also should address alternate site configuration, alternate methods of construction, and how adverse impacts to coastal resources will be minimized.

The Justification Analysis should include sufficient detail to clearly demonstrate demand for the proposed use and will allow OCM to determine the public need the proposed use. The Justification Analysis should explain the goods and/or services that the proposed coastal use will provide and include documentation that clearly demonstrates a public demand for, or public benefit resulting from, the proposed use. The analysis should provide enough information for OCM to determine that there is a reasonable chance that the project will be successful and not result in a situation where large scale destruction of resources is permitted for a project that fails economically, floods, causes flooding on adjacent areas or in some other way fails the public.

In general, the greater the resource or user group impacts, the more detail required for both the Alternatives and Justification Analyses. If reviewing this guide prior to submission of a Joint Permit Application (JPA) form, the information presented herein should be taken into consideration and addressed while developing the project. In most cases, alternatives, or the lack thereof, are evident and a simple discussion of the options considered is sufficient. This information can be provided in steps 11b-c of the JPA. If the information is not provided in or attached to the JPA, the OCM permit analyst will review the project and determine if any less damaging alternatives are evident. Additional information may be requested by the permit analyst in order to address the less damaging options he/she identified. Using the information contained in these analyses, OCM can effectively evaluate the proposed coastal use's conformance with the applicable Coastal Use Guidelines (specifically §701.F.3, 5, 7, 8, 10, 13, 16 and 19; §701.G.2 and 6; §701.H; §701.I; and all applicable Use Specific Guidelines).

Drainage features include gravity drainage channels and canals; water control structures; and pump stations and associated structures. If, in OCM's opinion, adverse impacts to coastal resources will occur during construction, maintenance and/or operation of a proposed activity, Alternatives and Justification Analyses will be required. The level of detail needed in the

Analyses is dependent on whether the activity is maintenance of existing features, expansion of existing features or installation of new features. A feasibility study done during the course of project development can be submitted as the Alternatives and Justification Analyses. If a feasibility study has not been done, the below information will assist in the development of Alternatives and Justification Analyses. OCM encourages applicants to avoid adverse impacts to coastal resources to the maximum extent practicable and will provide assistance with identifying alternate sites, minimizing impacts and developing a Justification Analysis.

2.0 Maintenance of Existing Drainage Features

Maintenance of existing drainage features includes clean out of existing channels, canals and ditches; control of existing bankline vegetation; and upkeep, repair and replacement of existing water control structures and pump stations. Brief Alternatives and Justification Analyses will be required if adverse impacts to coastal resources are likely to occur during maintenance activities. The information required in the analyses is dependent on the nature of the maintenance activity and the extent of resource impacts.

2.1 Alternatives Analysis

OCM recognizes that maintenance activities are limited to existing drainage features, therefore, an Alternatives Analysis for maintenance activities need not address alternate sites for performing the activity. The analysis instead should address methods and equipment to be used to perform the maintenance activity; the access route to the maintenance site; the size of the work area around the maintenance site; the location and manner of dredged material disposal; and the siting of staging area(s) that minimize adverse impacts to coastal resources to the maximum extent practicable. Only those aspects of the proposed maintenance activity that result in adverse impacts to coastal resources need be addressed. The analysis can take the form of a brief narrative that identifies all practical options for performing the work and siting the staging areas in order to avoid or minimize adverse impacts to coastal resources.

2.1.1 Method(s) and Equipment

OCM understands that the methods and equipment used to perform the maintenance activity may be limited by the type of activity to be done. If the methods and/or equipment used to perform the maintenance activity will result in adverse impacts to coastal resources, and options exist, the Alternatives Analysis should include:

1. An explanation of the method(s) and equipment to be used to access the site and perform the maintenance work. The narrative should identify and discuss all practical options for performing the work (e.g., land based versus water based operations; hydraulic or suction dredging versus bucket dredging or propwashing; etc.) and explain why each option was eliminated or chosen. If using economics as a deciding factor, provide cost comparisons of all options considered.
2. An explanation of any limiting factors and special equipment requirements.

2.1.2 Access

Access to the site should be selected to minimize adverse impacts to coastal resources. Existing access routes should be used in lieu of clearing and construction of new access routes. If adverse impacts to coastal resources will occur during access, the Alternatives narrative should include:

3. A map showing location, length and width of proposed and alternate access routes considered. This can be displayed on the project vicinity map or plan view plat.
4. An explanation of why each route was eliminated or chosen. Routes should be compared using the same criteria and the comparison should consider the extent of coastal resource impacts. Access equipment identified in #1 above should be route appropriate and should be selected to minimize adverse impacts to coastal resources.

2.1.3 Staging and Work Areas

The staging and work area(s) needed to perform the maintenance activities should be the minimum size necessary to safely store and access equipment and perform the maintenance activity. The staging area should be located on a site that avoids adverse impacts to coastal resources. If coastal resources will be impacted adversely by staging and/or work areas, the Alternatives narrative should include:

5. A discussion of all practical staging area locations and an explanation of why each was eliminated or chosen. The narrative also should explain the need for the size(s) of the staging and work area(s), any onsite limitations that may be present and any special equipment requirements. Maps, illustrations and site layout plans may be helpful in demonstrating space requirements and limitations.

2.1.4 Dredged Material Disposal

The manner and location of dredged material placement can greatly affect the extent of adverse impacts to coastal resources, especially vegetated wetlands. Previously elevated spoil banks may have subsided enough to revert to wetland habitat. Typically, spreading dredged material on vegetated wetland banklines to a height of no more than 6 inches may allow the wetlands to recover and revegetate within a reasonable amount of time. Stacking dredged material more than 6 inches high on adjacent banklines may result in significant impacts that should be avoided to the maximum extent practicable. If vegetated wetlands, or other coastal resources, will be adversely impacted by dredged material placement, the Alternatives narrative should include:

6. An explanation of all practical options for disposal of the dredged material. The narrative should include any equipment limitations that may exist and should compare each option identified using the same criteria. If using economics as a deciding factor, provide cost comparisons of all options considered.

2.2 Justification Analysis

The Justification Analysis for maintenance activities should be a narrative that explains why the maintenance work is required (i.e., identify the consequences of not performing the maintenance activities).

3.0 Expansion of Existing Drainage Features

Expansion of existing drainage features includes deepening and widening of currently existing, maintained channels, canals or ditches; and increasing capacity at existing pump stations and water control structures. For the purposes of this guide, maintained channels, canals and ditches are defined as those which require no more than 80% cross sectional excavation from original design specifications. If more than 80% of the cross sectional area of the channel, canal or ditch has filled in, reestablishment of the drainage feature will be considered a new feature for the purposes of Alternatives and Justification Analyses. Expansion activities that have adverse impacts on coastal resources will require Alternatives and Justification Analyses.

3.1 Alternatives Analysis

OCM recognizes that existing drainage feature expansion activities are limited to the location of the existing drainage feature, therefore, an Alternatives Analysis need not address alternate alignments. The Alternatives Analysis instead should address the methods and equipment to be used to perform the maintenance activity, the method of access to the maintenance site, the size of the work area around the maintenance site, the siting of staging area(s) and other options for protecting structures that minimize adverse impacts to coastal resources to the maximum extent practicable. The analysis can take the form of a narrative that identifies all practical options for performing the work (including water- versus land-based access). Only those aspects of the proposed maintenance activity that result in adverse impacts to coastal resources need be addressed. The analysis can take the form of a brief narrative that identifies all practical options for performing the work and siting the staging areas.

3.1.1 Method(s) and Equipment

OCM understands that the methods and equipment used to perform the expansion activity may be limited. If the methods and/or equipment used to perform the maintenance activity will result in adverse impacts to coastal resources, and options exist, the Alternatives Analysis should include:

1. An explanation of the method(s) and equipment to be used to access the site and perform the expansion work, including source of fill. The narrative should identify and discuss all practical options for performing the work and explain why each option was eliminated or chosen. If using economics as a deciding factor, provide cost comparisons of hauled in fill versus fill excavated on site for all options considered.
2. An explanation of any limiting factors and special equipment requirements.

3. For gravity drainage features, an explanation of how tidal surges and other storm events will affect reverse flow and flooding in the area the drainage feature is designed to protect.

3.1.2 Access

Access to the expansion site should be selected to minimize adverse impacts to coastal resources. If adverse impacts to coastal resources will occur during access, the above narrative should include:

4. A map showing location, length and width of proposed and alternate access routes considered. This can be displayed on the project vicinity map or plan view plat.
5. An explanation of why each route was eliminated or chosen. Routes should be compared using the same criteria and should include a consideration of coastal resource impacts. Access equipment identified in #1 above should be route appropriate and should be selected to minimize adverse impacts.

3.1.3 Staging and Work Areas

The staging and work area(s) needed to perform the expansion activities should be of the minimum size necessary to safely store and access equipment and perform the expansion activity. The staging area should be located on a site that avoids adverse impacts to coastal resources. If coastal resources will be impacted adversely by staging and/or work areas, the above narrative should include:

6. A discussion of all practical staging area locations and an explanation of why each was eliminated or chosen. The narrative also should explain the need for the size(s) of the staging and work area(s), any limitations that may be present on site and any special equipment requirements. Maps, illustrations and site layout plans may be helpful in demonstrating space requirements and limitations.

3.1.4 Other Options

Other options, such as the “no-build” option should be considered in lieu of expansion activities that adversely impact coastal resources. Structures in the protected area can be relocated or elevated to eliminate the risk of flooding. An Alternatives Analysis for expansion activities that may result in adverse impacts to coastal resources should address these options. The analysis can be a narrative that includes:

7. The type of structures and number of each type of structure in the protected area.
8. A comparison of costs for expansion activities versus relocating or raising of protected structures. The cost of the expansion activities should include the frequency and cost of anticipated future maintenance work.

3.2 Justification Analysis

The Justification Analysis should clearly demonstrate a public need and/or demand for the proposed drainage feature expansion. The analysis should include data that identifies the existing and proposed capacity of the drainage feature; the entire area to be affected; the number and type (houses, businesses, churches, etc.) of structures located within that area; the current water flow patterns into and out of that area; and the frequency and severity of historic flooding events in that area. The analysis also should explain why the existing drainage capacity is not sufficient and what capacity is needed. The Justification Analysis can take the form of a feasibility study done during the normal course of project planning and should be provided in its entirety. If a feasibility study has not been done, please refer to the outline for a Justification Analysis in the New Drainage Features section below.

4.0 New Drainage Features

New drainage features include lengthening existing channels, canals and ditches; excavating previously non-existent channels, canals and ditches; and installing new pump stations or water control structures. If, in OCM's opinion, adverse impacts to coastal resources may occur during or after construction, Alternatives and Justification Analyses will be required. A formal feasibility study done during the course of project planning can be submitted as the Alternatives and Justification Analyses. OCM recognizes that drainage features are designed for a specific purpose and affect areas much larger than the footprint of construction. Because of this OCM recommends that justification be addressed first, with alternatives addressed after the project objective(s) and area(s) of impact (direct and indirect; adverse and beneficial) are identified.

4.1 Justification Analysis

The Justification Analysis should clearly demonstrate a public need/demand for the proposed drainage feature. The analysis should include data that identifies the entire area to be affected; the number and type of structures (houses, businesses, churches, etc.) located within the affected area; the current water flow patterns into and out of the affected area; the frequency and severity of historic flooding events in the affected area; and historic habitat information and salinity patterns (if applicable to the project objective) in the affected area. The most appropriate form of Justification Analysis for new drainage features is a feasibility study done during the normal course of project planning and should be provided in its entirety, if available. Hydrologic studies may be required depending on the size of the area to be affected by the drainage feature and the extent of direct and indirect adverse impacts to coastal resources.

If no formal feasibility studies have been done, this section offers an outline of the information OCM requires to document the need/demand for the proposed drainage feature. Table 1 can be used to determine the level of detail required in the Justification Analysis. The affected area land use refers to the type and level of usage of the area to be affected by the drainage feature. The need for drainage features may be easily justified in high development areas, however as the type and level of land use in the affected area changes, the justification for the drainage feature likewise will change.

Table 1 – Determining the level of detail required in the Justification Analysis.

Area Affected by Feature	Direct Resource Impact from Construction (% of total construction impact)			Affected Area Land Use †
	Low (≤20%)	Med (20.01-70%)	High (>70.01%)	
Small (less than 200 acres)	S	S/M *	M	High (dense residential/commercial/industrial)
	S	S/M *	M	Moderate (light residential/commercial, agriculture)
	M	M	C	Low (no development)
Large (200 acres or more)	S	S/M **	M/C **	High
	S/M **	M/C **	M/C **	Moderate
	M/C **	C	C	Low

S=Simple, low level of detail, M=Moderate, mid-level of detail, C=Complex, high level of detail
 * If more than 5 acres of resource impact will occur from construction activities, higher level of detail is required.
 ** If more than 10 acres of resource impact will occur from construction activities, higher level of detail is required.
 † Refers to the type and extent of the uses occurring on lands within the area affected by the drainage feature; the higher the degree of affected area land use, the lower the level of detail needed in the Justification Analysis)

4.1.1 Simple Justification (S)

1. Provide a narrative that explains the need for the drainage feature.
2. Provide documentation that clearly explains/illustrates the existing and proposed water flow patterns in the area to be affected by the drainage feature.
3. If proposing water control structures or pumps provide the operational schedule or plan for the opening and closing of the structures and an explanation of why this schedule or plan was chosen.
4. Identify the location, number and type of structures (houses, businesses, churches, etc.), other features and land uses occurring in the area affected by the drainage feature (if applicable to project objective).

4.1.2 Moderate Justification (M)

Provide information for 1-4 above, plus:

5. Include in #1 above historic information related to past flooding events, such as, conditions that resulted in the flooding events, duration of flooded conditions, frequency of events and the environmental and socioeconomic impacts resulting from those events.
6. Include in #4 above any planned or projected future development or use within the affected area.

7. Provide information related to habitat type, salinity, land loss and subsidence in the area affected by the drainage feature and explain how the drainage feature is expected to alter these parameters.
8. If coastal resources (mainly vegetated wetlands) will become isolated from coastal influences by impoundment within the hydrologically altered area, explain why this impoundment cannot be avoided and explain the impacts and benefits to the various habitats to be impounded.

4.1.3 Complex Justification (C)

Provide information for 1-8 above, plus:

9. Provide the capacity of the proposed drainage feature and explain how the feature will alter the existing water flow patterns. Include the conditions under which existing features would be overwhelmed, how often this is anticipated to occur and how the new drainage feature will alleviate this.
10. Discuss the consequences of the “no-build” option and provide a cost comparison of the selected option versus relocating or elevating structures at risk if the drainage feature is not constructed (if applicable to the project objective).
11. If the objective of the feature is to manage habitat in the affected area, explain the effects on habitat if the area is not managed.

Please note that additional information may be required in response to comments received during the public notice period.

4.2 Alternatives Analysis

Every effort should be made to route/site drainage features such that adverse impacts to coastal resources are avoided or minimized to the maximum extent practicable. The goal of an Alternatives Analysis is to find a route or site for the proposed drainage feature which results in the least amount of adverse impact (both direct and indirect) to coastal resources while allowing the project to fulfill its main objective(s). The Alternatives Analysis provides an objective method of performing a fair and thorough consideration of feasible options for the location, construction, operation and maintenance of the proposed drainage feature. **Feasible routes/sites** are defined as any route/site that can support the main objective(s) of the proposed development. Current aerial photography and/or specific knowledge of the area can be used to identify feasible routes/sites. Project objective(s), surrounding land use, total project impact and type and extent of coastal resource impacts should be considered when selecting feasible alternative routes/sites.

Documentation that clearly demonstrates that each route was compared equally and explains why each route was eliminated or chosen will be required. Documentation that supports the reasons for elimination of alternatives should be included in the analysis. All alternate routes and the preferred route must be compared using, at a minimum, the factors identified below. If

other factors not identified by OCM are used to compare sites, please define those factors and explain how they were used to evaluate each route. Table 2 can be used to determine the minimum range of alternatives that should be considered when developing an Alternatives Analysis.

Table 2 – Determining the Range of Alternatives that should be considered when proposing a new drainage feature.

Scope of Feature	Direct Resource Impacts from Construction (% of total construction impact)		
	Low (<10%)	Med (10.01-30%)	High (>30.01%)
Small (one mile or less for linear features, one acre or less for non-linear features)	Category 1	Category 2	Category 3
Large (more than one mile for linear features, more than one acre for non-linear features)	Category 2/3*	Category 2/3*	Category 3
* If more than 2 acres of resource impact will occur, higher level of detail is required.			

A minimum of three (**Category 1**), five (**Category 2**) or seven (**Category 3**) alternate feasible routes/sites must be considered. Each route/site should be compared using the same parameters and should, at a minimum, include the items listed below.

1. Define the project objective(s) and identify all of the proposed features required to meet the objective(s). Identify any project objectives that may limit the range of alternatives to be considered. Identify the area(s) to which the proposed drainage feature will provide protection and/or habitat or water management opportunities.
2. Identify, on a map, the area to be affected by the drainage feature and identify each route/site considered for the drainage feature. If less than the minimum number of routes/sites have been considered, please explain why and provide documentation demonstrating the efforts made to find alternate routes/sites.
3. Describe the area to be affected by the drainage feature. Include type and extent of habitats within the affected area and the condition of those habitats and salinity, subsidence and land loss information, if known. For gravity drainage features, include an explanation of how tidal surges and other storm events will affect reverse flow and flooding in the area the drainage feature is designed to protect.
4. Describe each route/site considered. Include topography, effects on surface hydrology, and cost. If access to the property is limited or unavailable, explain the limitations and provide any information that can be gained about the route using current photography and topographic and habitat maps. Identify any limiting factors and explain how those factors limit or restrict construction of the project.
5. Identify the minimum required capacity of the drainage feature to meet the project objectives. If material excavated from the feature will be placed on-site and coastal resources will be impacted, include in the narrative a discussion of removing the

material and disposing of it at an approved facility or using the material beneficially to create marsh in another location.

6. A no-build option also is an acceptable alternative. This option may include relocating or elevating structures currently existing in the affected area (if applicable to project objective). A no-build discussion should include the number and types of structures (homes, businesses, churches, etc.) affected and the estimated costs of relocating or elevating those structures compared to the cost of construction and future maintenance of the proposed drainage feature. If the objective of the drainage feature is to manage habitat within the affected area, discuss the consequences of not constructing the drainage feature.
7. Provide a narrative explaining the reasons for the elimination or selection of each route/site presented. Please note that the factors used to compare each route should be identified and should be consistent among routes.