


ALASKA LNG PROJECT	DOCKET NO. CP17-____-000 RESOURCE REPORT NO. 3 APPENDIX K – NOXIOUS/INVASIVE PLANT AND ANIMAL CONTROL PLAN	DOC No: USAI-PE-SRREG-00- 000003-000 DATE: APRIL 14, 2017 REVISION: 0
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**APPENDIX K      NOXIOUS/INVASIVE PLANT AND ANIMAL CONTROL PLAN**




**DOCKET NO. CP17-\_\_\_-000**  
**NOXIOUS/INVASIVE PLANT AND ANIMAL**  
**CONTROL PLAN**

**USAI-P2-SPZZZ-00-000011-000**


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Note: This draft plan discusses preventative and control measures to avoid or minimize the spread of noxious weeds during the construction and restoration phases of the Alaska LNG Project (Project). A discussion of monitoring activities would be included in the final plan to evaluate the level of success and practicability of the control measures implemented. Using other project plans, this draft has been prepared that addresses comments by the U.S. Fish and Wildlife Service (USFWS) comments to Resource Report No. 3. The contents (i.e., noxious weed inventory and agency recommendations) have been updated to make it consistent with the invasive species survey information that is presented in Resource Report No. 3.

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## 1.0 INTRODUCTION

The Alaska LNG Project includes the following: a liquefaction facility (Liquefaction Facility) in Southcentral Alaska; an approximately 807-mile gas pipeline (Mainline); a gas treatment plant (GTP) within the PBU on the North Slope; an approximately 62-mile gas transmission line connecting the GTP to the PTU gas production facility (PTU Gas Transmission Line or PTTL); and an approximately 1-mile gas transmission line connecting the GTP to the PBU gas production facility (PBU Gas Transmission Line or PBTL).

### 1.1 PURPOSE

Noxious/Invasive species are defined as non-indigenous, undesirable native, or introduced species that are able to out-compete desired native species. The goal of the preventative and control measures identified in this *Noxious/Invasive Plant and Animal Control Plan* (Plan) is to prevent the spread of existing noxious/invasive weeds and animals identified in Project areas and avoid invasion of new sites or new noxious/invasive species by applying prevention and control measures where applicable and appropriate. The objectives are to comply with agency requirements designed to prevent the spread of noxious/invasive species and to implement control measures in areas of the Project that are identified to be of special concern. Areas along the Project where disturbance would occur and where existing species are present would be targeted in carrying out these measures.

### 1.2 SCOPE

This plan would be effective during all construction and restoration phases of the Project, and at all Project work sites, including all off-right-of-way (off-ROW) work areas.

### 1.3 REGULATORY FRAMEWORK


#### 1.3.1 Federal Requirements

Federal regulations pertaining to the introduction of noxious/invasive species include:

- Section 1204 of the National Invasive Species Act of 1996.
- Federal Noxious Weed Act of 1974 (7 U.S.C. §§ 2801-2814, January 3, 1975, as amended 1988 and 1994.).
- Plant Protection Act (7 U.S.C. §§ 7701 et seq.)
- Executive Order 13112 of February 3, 1999, which requires the federal government to prevent the introduction of invasive species, provide for their control, and minimize their impacts.
- 33 C.F.R. Part 151 (Vessels Carrying Oil, Noxious Liquid Substances, Garbage, Municipal or Commercial Waste and Ballast Water), 46 C.F.R. Subpart 162.060 (Ballast Water Management Systems) as last revised in 2012, and the United States Coast Guard's (USCG's) Navigation and Vessel Inspection Circular 07-04, Change 1, dated October 29, 2004, which regulate ballast water discharges.

#### 1.3.2 State Requirements

State regulations for preventing the introduction and spread of noxious/invasive species are mandated by the following regulations:

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- AS 16.05.020 extends the authority of the Alaska Department of Fish and Game to manage, protect, maintain, improve, and extend the fish, game, and aquatic plant resources of the state in the interest of the economy and general wellbeing of the state.
- 5 AAC 92.141, which prohibits the transport, harboring, or release of muridae rodents.
- 11 AAC 34.020 which prohibits and restricts certain noxious weeds.
- Sec. 03.05.027. Noxious weed, invasive plant, and agricultural pest management and education.
- AS 46.03.750. Regulates ballast water discharge.

### 1.3.3 Agency-Specific Requirements

The appropriate federal and state land management agencies would be consulted to review this draft plan and make any adjustments necessary to address their comments and to identify the appropriate treatment measures allowable on their lands prior to implementation.

#### 1.3.3.1 Bureau of Land Management (BLM)

On Bureau of Land Management (BLM)-administered lands, herbicide use may be authorized if used in accordance with the Final Programmatic Environmental Impact Statement (EIS) – BLM Vegetation Treatments Using Herbicides, September 2007.

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## 2.0 RESPONSIBILITIES

Responsibilities for implementation of this Plan, including responsibilities of key personnel, are described in the following sections.

### 2.1.1 Project Entity

The Project entity would be responsible for:

- Identifying and delineating noxious weed infestations and identifying potential aquatic nuisance species at all Project work sites ahead of construction. All infestation locations would be clearly mapped, flagged, and reported to applicable agencies if found in undocumented areas.
- Providing all construction personnel with information and training regarding noxious/invasive plants and animals species management. All field staff would be informed of the importance of preventing the spread of noxious/invasive plants and animals as a result of construction activities.
- Consulting with appropriate land management agencies to identify appropriate treatment and mitigation if they are different than the measures outlined here. These measures would be incorporated into the final version of this Plan issued prior to construction.

#### 2.1.1.1 Project Entity Environmental Inspectors

The Environmental Inspectors would be responsible for:


- Ensuring prevention and control measures contained in this Plan are implemented.
- Ensuring equipment is clean and free of weeds before entering the construction zone and exiting weed infested areas.
- Ensuring that identified areas with invasive plants are identified, cleared, and stockpiled separately from topsoil and subsoil.

### 2.1.2 Contractor(s)

The contractor(s) would be responsible for:

- Implementation of the prevention and control measures contained in this Plan.
- Engaging the services of a licensed Alaska Certified Pesticide Applicator (per 18 AAC 90.300) for application of herbicides where required.



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### 3.0 NOXIOUS/INVASIVE PLANTS

#### 3.1 TRANSPORTATION PATHWAYS

Project construction could propagate noxious/invasive plants through several pathways. However, propagation would likely be limited to the area of disturbance, and the measures outlined in this Plan would be implemented to prevent the spread of these known locations.

These potential pathways include:


- Transport and use of construction equipment and personnel from where noxious/invasive plants are common.
- Spread of noxious/invasive plants already associated with existing rights-of-way (Alaska Railroad Corporation {ARRC}, Trans-Alaska Pipeline System {TAPS}, and highways) by construction equipment and personnel.
- Transport of invasive plant material from other areas within the state or other states via straw construction mats, machinery, footwear and clothing, hand tools, and vehicle tires.

#### 3.2 SPECIES

Noxious/invasive plants thrive and establish quickly on recently disturbed soils. Invasive plants are aggressive in growth and reproduction, are generalists, and are tolerant to many environmental conditions. Noxious/invasive plants potentially occurring in the Project area are listed in Table 1. Thus, they outcompete and displace native plants once exposure has allowed establishment. Noxious/invasive plants with the highest ranking for invasiveness reported from the Project area include bird vetch (*Vicia cracca*), waterweed (*Elodea* sp.), white sweetclover (*Melilotus alba*), and reed canarygrass (*Phalaris arundinacea*) (Table 1; AKEPIC, 2014). White sweetclover has the most extensive distribution due to its adaptable properties and introduction into Alaska in the early 1900s (Alaska Department of Natural Resources {ADNR}, 2011). The Alaska Natural Heritage Program (AKNHP) has reported white sweetclover in the Arctic, Interior, and coastal areas of Alaska where it thrives along roadsides and disturbed areas. White sweetclover is currently found in the area of the Mainline corridor from the Alaska to the Brooks Range (AKEPIC, 2014). White sweetclover degrades natural grasslands and is fire tolerant, and can also impair riparian areas/floodplains.. Its presence alters soil characteristics and the species is highly prolific, with seeds documented to be viable for up to 81 years (AKNHP, 2011).

Three alien species of seaweeds have been identified in Alaska: the seagrass (*Ceramium kondo*), a purple cold water seaweed (*Porphyra purpurea*), and the Japanese wireweed (*Sargassum muticum*). These species have not been classified as invasive and are not known to occur within the Project area. In addition to these species, Dead Man's Fingers (*Codium fragile*), native to Japan, has been identified in Prince William Sound, but is not known to occur in the Project area.

Freshwater and marine planktonic plants and animals can also be invasive. Of concern in Alaska are such planktonic organisms as the spiny water flea tiny cladoceran an aquatic crustacean and invader from Europe, the skeleton shrimp (*Capella mutica*) (ADF&G 2002, Shaw 2011). Transport of coastal planktonic organisms in ballast water of commercial ships appears to be a major source of new invasions worldwide. High latitude cold-water regions are also subject to biological invasions with potential ecological and economic consequences similar to those reported for more temperate latitudes.

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### 3.3 GENERAL APPROACH

The following general approaches would be used to avoid the introduction or spread of noxious/invasive plants as a result of Project activities:

- Conduct preconstruction field surveys to determine the location and extent of existing noxious weed infestations at all Project work sites. These areas would then be noted during construction planning for that area and workers informed of what to look for to ensure the appropriate precautions are taken.
- Prior to clearing and grading operations, pre-treat unavoidable infestations within the approved Project footprint. This may involve mowing and/or the application of herbicides depending upon agency recommendations and site-specific limitations.
- Where deemed necessary, cleaning stations (water or air) would be operated during clearing and grading operations; cleaning stations will be isolated and will be inspected after being treated and cleaned to prevent spread from the cleaning station into other areas of the project.
- All field vehicles and construction equipment arriving from out of state would be cleaned prior to beginning work in the Project area and would be maintained in a weed-free state during the construction process.

Following construction and reclamation, a monitoring program may be established to identify locations where weeds are reestablishing and to prescribe the appropriate control treatments to facilitate revegetation by desired plant species. Monitoring activities would evaluate the level of success and efficiency of the control measures implemented as outlined in the Alaska LNG Project *Upland Erosion Control, Revegetation, and Maintenance Plan* (Alaska LNG Project Plan).

**Table 1: Invasive Plant Occurrence by Facility and Ecoregion**

Common Name	Scientific Name	Habitat	Form	Rank	LNG	Mainline ROW				Mainline Facilities			
					Alaska Range Transition	Alaska Range Transition		Arctic Tundra	Intermontane Boreal	Alaska Range Transition	Arctic Tundra	Intermontane Boreal	
					CI	AR	CI	BR	RM	AR	BR	RM	Y-TU
Alsike Clover	<i>Trifolium hybridum</i> L.	Well adapted to wide range of soil types, latitudes, and elevation	Forb/herb	57								4	
Annual Bluegrass	<i>Poa annua</i> L.	Lawns, gardens, cultivated crops, pastures, roadsides, areas of habitation, and other open areas	Graminoid	46		1							
Bird Vetch	<i>Vicia cracca</i> L. ssp. <i>cracca</i>	Waste places, old fields, and roadsides	Forb/herb	73						1		1	
Common Dandelion	<i>Taraxacum officinale</i> F.H. Wigg.	Moist sites, lawns, meadows, pastures, and overgrazed areas. It also occurs in roadsides, waste places, and old fields.	Forb/herb	58	2					1	2	11	1
Common Pepperweed	<i>Lepidium densiflorum</i> Schrad.	Disturbed areas, roadsides, waste areas, farmyards, and cultivated fields	Forb/herb	25								7	1
Common Plantain	<i>Plantago major</i> L.	Cultivated fields, lawns,	Forb/herb	44				1			3	9	

Common Name	Scientific Name	Habitat	Form	Rank	LNG	Mainline ROW				Mainline Facilities			
					Alaska Range Transition	Alaska Range Transition		Arctic Tundra	Intermontane Boreal	Alaska Range Transition	Arctic Tundra	Intermontane Boreal	
					CI	AR	CI	BR	RM	AR	BR	RM	Y-TU
		roadsides, and waste areas. It can be found in open woods, valleys, and mid-montane site											
Foxtail Barley	<i>Hordeum jubatum</i> L.	Foxtail barley commonly grows in waste areas, roadsides, and open fields. It is most prevalent on soils with high water tables and high salinities.	Graminoid	63		1		1		2	9	18	1
Herb Sophia	<i>Descurainia sophia</i> (L.) Webb ex Prantl	Roadsides, pastures, cultivated areas, and old fields	Forb/herb	41								1	
Lambsquarters	<i>Chenopodium album</i> L.	Grows rapidly and requires moderate soil moisture. It grows best on disturbed, highly organic soil.	Forb/herb	37								4	
Narrowleaf Hawksbeard	<i>Crepis tectorum</i> L.	Wide range of climate and soil conditions	Forb/herb	56		1			2	2	1	13	
Narrowleaf Hawkweed	<i>Hieracium umbellatum</i> L.	Roadsides, at forest edges, and in openings	Forb/herb	51								2	
Oxeye Daisy	<i>Leucanthemum</i>	Native grasslands,	Forb/herb	61							1		

Common Name	Scientific Name	Habitat	Form	Rank	LNG	Mainline ROW				Mainline Facilities			
					Alaska Range Transition	Alaska Range Transition		Arctic Tundra	Intermontane Boreal	Alaska Range Transition	Arctic Tundra	Intermontane Boreal	
					CI	AR	CI	BR	RM	AR	BR	RM	Y-TU
	vulgare Lam.	pastures, waste areas, meadows, and roadsides											
Pineappleweed	Matricaria discoidea DC	Compacted soils in farmyards, waste areas, and roadsides	Forb/herb	32		1					1	9	
Prostrate Knotweed	Polygonum aviculare L.	Roadsides, sidewalks, paved areas, gardens and cultivated fields	Forb/herb	45		1					1	6	
Reed Canarygrass	Phalaris arundinacea L.	Stream banks, spring margins, and wet meadows	Graminoid	83	1								
Smooth brome	Bromus inermis Leys.	Roadsides, forests, prairies, fields, lawns, and lightly disturbed sites	Forb/herb	62								2	
Kentucky bluegrass	Poa pratensis L. ssp. irrigata (Lindm.) H. Lindb. or Poa pratensis L. ssp. pratensis	Meadows, open woodlands, prairies, and disturbed sites.	Graminoid	52								1	
White Clover	Trifolium repens L.	Waste areas, lawns, and ditches	Forb/herb	59			1						
White Sweetclover	Melilotus alba medikus	Waste places and roadsides	Forb/herb	81		2			3	1	1	24	

Common Name	Scientific Name	Habitat	Form	Rank	LNG	Mainline ROW				Mainline Facilities				
					Alaska Range Transition	Alaska Range Transition		Arctic Tundra	Intermontane Boreal	Alaska Range Transition	Arctic Tundra	Intermontane Boreal		
					CI	AR	CI	BR	RM	AR	BR	RM	Y-TU	
Yellow Sweetclover	<i>Melilotus officianlis</i> L.	Waste places and roadsides	Forb/herb											
Yellow Toadflax <sup>d</sup>	<i>Linaria vulgaris</i> P. Mill.	Sandy and gravelly soils in roadsides, pastures, cultivated fields, meadows, and gardens	Forb/herb	69	1									
Number of occurrences					4	7	1	2	5	9	19	112	3	


Source: AKEPIC, 2014 – Alaska Exotic Plants Information Clearinghouse

<sup>a</sup> Species occurring with the Project area. No invasive plant records occur in the vicinity of the Gas Treatment Plant (GTP) or Point Thomson Gas Transmission Line (PTTL) in the Beaufort Coastal Plain Ecoregion.

<sup>b</sup> Ecoregion Abbreviations: BCP – Beaufort Coastal Plain; BF – Brooks Range Foothills; BR – Brooks Range; KRV – Kubuk Ridges and Valleys; RM – Ray Mountains; YTU – Yukon-Tanana Uplands; TKL – Tanana-Kuskokwim Lowlands; AR – Alaska Range; CI = Cook Inlet Basin

<sup>c</sup> Invasiveness rank is calculated based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems. Species with an invasive rank of 60 or higher will be given priority for removal.

<sup>d</sup> Species is rhizomatous

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## 4.0 NOXIOUS WEED MANAGEMENT

### 4.1 IDENTIFICATION OF PROBLEM AREA LOCATIONS

Noxious weed surveys would be conducted at all Project work sites during biological field surveys prior to construction. Once the locations, areal extent, and magnitude of problem area locations are defined, the appropriate land management agencies would be consulted to develop final treatment plans, which would be communicated to Contractor(s).

Prior to construction, noxious weed infestation areas of concern would be identified and flagged with signage in the field. Species with an invasive rank of 60 or higher will be given priority for removal (Table 1). The signage and flagging is intended to alert construction personnel to the infestation and thereby prevent vegetation and ground disturbance until noxious weed treatment measures have been completed.

### 4.2 PREVENTATIVE MEASURES

#### 4.2.1 Field Vehicles and Equipment

Before field vehicles, construction equipment, aircraft, or watercraft are allowed onto Project sites, they would be cleaned to remove weeds. The Environmental Inspectors would check each piece of excavating equipment upon delivery to the contractor yard, staging areas, or the ROW.

#### 4.2.2 Field Cleaning – Wash Stations (Air or Water)


Following initial entry into significant high-infestation locations, field weed wash stations may be set up on site at the exit point of the infestation until the topsoil or grading has been completed.

Typical cleaning methods employed at cleaning stations include:

- Cleaning with power or high-pressure equipment (e.g., water or compressed air) to remove seeds, roots, and rhizomes from the equipment before transport off-site.
- Cleaning concentrated on tracks or tires and on the undercarriage, with special emphasis on axles, frames, cross members, motor mounts, the underside of running boards, and front bumper/brush guard assemblies.
- In muddy conditions, set up a mat platform with containment and clean the vehicles and equipment with high pressure water. Develop specific containment and disposal measures for wash station on a site-by-site basis.
- Sweep out vehicle cabs and dispose of refuse in covered waste receptacles within the wash station.

#### 4.2.3 Right-of-Way (ROW) Clearing/Grading

At high-infestation upland locations, full-width stripping of the top 6 inches of soil would be done following pre-treatment. Depth of stripping is dependent on species present and may be adjusted accordingly for proper removal of invasive species rhizomes. Cleared vegetation and stripped soil stockpile would be placed on the ROW adjacent to the area of removal. Weed-infested stockpiles would be marked with signage until finished grading, whereupon the Contractor would return soil and vegetative material to the location of origin. The Contractor would not be permitted to move soil and vegetative matter outside of the delineated noxious weed location.

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#### 4.2.4 Borrow Areas and Imported Fill Material

Prior to utilizing any proposed or existing borrow area; noxious weed surveys would be performed to confirm the presence or absence of noxious weeds. If noxious weeds are discovered, applications or approved herbicides would be used to destroy existing plants. The top 6 inches of soil would then be removed and stockpiled on site. Only the subsoil material would be transported off site.

Top soils and subsoils excavated along the ROW would be returned to their original vicinity and not transferred elsewhere. Backfill and padding material would be imported from approved borrow areas. Following weed free gravel inspections, an inspection for invasive weeds would be performed.

#### 4.2.5 Hay and Straw Bales

The Contractor would verify that straw bales used for sediment barrier installations or mulching are certified weed-free. If weed free bales are unavailable, alternative control measures would be employed in accordance with the Alaska LNG Project *Plan* and Alaska LNG Project *Wetland and Waterbody Construction and Mitigation Procedures* (Alaska LNG Project *Procedures*). The Environmental Inspectors would confirm that all straw brought to the project sites is certified as weed-free.

#### 4.2.6 Final Cleanup and Seeding

The Contractor would perform final grading of disturbed soils after construction or backfilling. Permanent seeding would be done during the appropriate season as specified in the Alaska LNG Project *Plan*. Seed mixtures used to revegetate exposed soils could contain noxious/invasive plant seeds. However, most mixtures have a maximum allowable weed seed limit.

Continuing revegetation efforts after the first several growing seasons may be necessary to encourage growth of desired vegetative cover to deter invasion by noxious weeds. This work may also employ mowing or herbicide applications.


### 4.3 TREATMENT METHODS

Noxious weed control measures would be implemented in accordance with existing regulations and jurisdictional land management agency or landowner agreements. Control efforts would focus on areas with designated noxious weed species, unless other agreements have been made with the jurisdictional agencies. Coordination with appropriate agencies to determine which of the species would require treatment and to determine appropriate treatment schedules would continue.

Control measures may use one or more of the following treatment methods:

- **Manual methods:** Where appropriate in portions of the Project south of the Beaufort Coastal Plain Ecoregion, weeds would be pulled by hand. If seeds are already present, the plant and seeds would be removed from the site and destroyed.
- **Mechanical methods:** Equipment would be used to mow or disk weed populations. Any mowing or disking of weeds would occur prior to seed head development. Subsequent seeding with suitable restoration seed mix would be conducted as soon as possible following soil disturbance to reestablish a stabilizing suitable vegetation cover and slow the potential re-invasion of noxious weeds.



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- Herbicide application:** Herbicide application would be used to remove, reduce, or contain noxious weed populations. Herbicides would likely be the best option for larger infestations and for perennial species that do not respond well to manual and mechanical methods. The particular herbicide used and its rate of application depend on specific site characteristics, target plants, non-target vegetation, and land use. Herbicides are a particularly important method of treatment when complete eradication of a population is the management objective. Treatment at the earliest stage of invasion would greatly reduce the future need for additional herbicide applications. Herbicides often provide the only effective and feasible control of rhizomatous species, and species for which hand pulling or cutting is not effective. If applied in a specific manner and according to the label, herbicides can be extremely efficient in selectively removing weeds that are mixed in with native vegetation. This approach can reduce the amount of revegetation needed after the treatment is complete (Greenstein et al., 2013ab). Applications would be controlled, as described in Section 4.3.1 (Herbicide Treatment Methods), to minimize or avoid impacts on surrounding native vegetation.

Treatment methods would be species-specific and based on area-specific conditions (e.g., proximity to water, riparian areas, and time of year) and would be coordinated with the local regulatory offices of the land manager as well as permitting agencies.

### 4.3.1 Herbicide Treatment Methods

Where permitted and agreed upon by the appropriate land management agency, preconstruction and post-reclamation noxious weed control would be carried out using herbicide treatment methods. Only herbicides that are permitted by the respective land management agencies would be used and would be used in accordance with applicable regulations. Necessary permits and authorizations would be obtained prior to herbicide application.

Preconstruction treatment would consist of a broad-spectrum herbicide application to identified noxious weed infestations on Project work sites. This application is intended to avoid spread of infestations as a result of ensuing construction-related vegetation and soil disturbance.

In reclaimed areas where noxious weeds may become interspersed with native vegetation, the herbicide application method would be adapted to target only noxious weeds and, therefore, preserve and retain native plants.


#### 4.3.1.1 Herbicide Application

A state-licensed pesticide management company would perform herbicide treatments in accordance with applicable laws and regulations. No treatments would occur without prior coordination with and concurrence of jurisdictional agencies or landowners. Herbicide applications would comply with U.S. Environmental Protection Agency (EPA) and manufacturer label instructions.

Vehicle-mounted sprayers may be used mainly in open areas that are readily accessible by vehicle. Hand-application methods (that target individual plants) would be used to treat small or scattered weed populations in rough terrain.

Herbicides would be transported to the application locations daily with the following provisions:

- Herbicide containers would not be stored on Project sites overnight – only the quantity needed for that day's work would be transported.
- Herbicides would be transported in approved containers, in a manner that prevents tipping or spilling, and in a compartment isolated from food, clothing, and safety equipment.
- Where practicable, mixing would be done at a distance greater than 200 feet from open or flowing water, wetlands, or other sensitive resources.

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- Herbicides would not be applied in wetlands.
- All herbicide equipment and containers would be inspected for leaks daily.

#### 4.3.1.2 Herbicide Handling

All reasonable and prudent precautions would be taken to avoid herbicide spills. In the event of a spill, immediate cleanup actions would be implemented. The licensed pesticide applicator would have immediate access to spill response equipment at all locations. Typical herbicide spill response kits would, at a minimum, include:

- Protective clothing and gloves.
- Adsorptive clay, or other commercial adsorbent.
- Plastic bags with twist ties.
- Sealable temporary storage containers.
- Shovels.
- Decontamination materials.

Use of herbicides is subject to procedures included in the Project *Spill Prevention, Control, and Countermeasure (SPCC) Plan*.

## 5.0 NOXIOUS/INVASIVE ANIMAL SPECIES

Non-indigenous animal species can be introduced by a variety of human activities. Potential introduction pathways associated with the construction of the Project include:

- Cargo shipments by air, land, or sea.
- Commercial vessels and aircraft.
- Discharge of ballast water from ships and barges.
- Fouled hulls, propellers, and rudders of recreational and commercial vessels.
- Discharge of hydrostatic test water from waters already infested.

Invasive animal species of concern are provided in Table 2.

**Table 2: Invasive Animal Occurrence by Region**

Common Name	Scientific Name	Habitat	Type	Region
Norway rat	<i>Rattus norvegicus</i>	Man-made structures such as boats, houses, barns, tunnels, urban areas, damp areas such as riverbanks	Mammal	All
Northern pike	<i>Esox lucius</i>	Areas of dense vegetation in streams, lakes, rivers, shallow waters near shore with covering	Fish	All except south and east of the Alaska Mountain Range
Atlantic salmon	<i>Salmo salar</i>	Marine and freshwater environments, flowing rivers of moderate gradient	Fish	Bering Sea, Aleutian Islands, Southeast Alaska
Green crab	<i>Carcinus maenas</i>	Marine environments, not yet found in Alaska	Invertebrate	N/A
New Zealand mudsnail	<i>Potamopyrgus antipodarum</i>	Rivers, reservoirs, lakes, and estuaries, not yet found in Alaska	Invertebrate	N/A
Chinese mitten crab	<i>Eriocheir sinensis</i>	Aquatic, temperate climates, not yet found in Alaska	Invertebrate	N/A
Zebra mussel	<i>Dreissena polymorpha</i>	Freshwater lakes, streams, and rivers, not yet found in Alaska	Invertebrate	N/A
Signal crayfish	<i>Pacifastacus leniusculus</i>	Perennial streams, rivers and lakes which offer refuges in the form of tree roots and/or rocks.	Invertebrate	Southcentral Alaska
Spiny water flea	<i>Cladocera</i> spp.	Freshwater lakes, not yet found in Alaska	Invertebrate	N/A
Pacific transparent sea squirt	<i>Ciona savignyi</i>	Marine environments, found in shallow waters	Invertebrate	Southern Alaska
Golden star tunicate	<i>Botryllus schlosseri</i>	Marine environments found in shallow waters	Invertebrate	Southern Alaska
Violate tunicate	<i>Botrylloides violaceus</i>	Marine environments. Grows on a variety of man-made and natural substrates in shallow subtidal zones.	Invertebrate	Southern Alaska
Glove leather tunicate	<i>Didemnum</i>	Marine environments.	Invertebrate	Southern Alaska

Common Name	Scientific Name	Habitat	Type	Region
	<i>vexillum</i>	Grows on a variety of man-made and natural substrates in shallow subtidal zones.		
Source: Alaska Natural Heritage Program: Non-Native and Invasive Animals of Alaska: A Comprehensive List and Select Species Status Reports, Final Report 2008				

## 5.1 INFESTATION PATHWAYS AND PREVENTION MEASURES

### 5.1.1 Cargo Shipping

Noxious/invasive species can be transported by land, sea, and air, including via airplanes, helicopters, vessels, cars, trucks, and heavy machinery. Of particular concern in Alaska is transport and spread of invasive Norway rats, which can stow away on aircraft, cargo vehicles, and vessels.


To prevent new invasions or spread of non-native rodents, especially Norway rats, roof rats, and house mice, into Alaska, the state has instituted several measures, including:

- Ships, aircraft, trucks, or other transport vessels entering Alaska or traveling between Alaskan cities and ports are maintained as rat-free.
- Main entry points to Alaska’s island, mainland, and community borders have been secured against rat invasion.
- Effective procedures are in place throughout Alaska for quarantine, surveillance, and effective response to rat sightings.
- “Rat spill” response and eradication teams have been created and are ready to respond quickly and eradicate found rats.
- Public and animal health and safety regulations, codes, and procedures are in place to prevent the spread of rats, and provide for more effective discovery and control of rat populations.

### 5.1.2 Ballast Water

Commercial vessels use water for ballast. When the ship is loaded at the port-of-origin, water is taken onboard to balance the ship’s buoyancy. Water that is taken onboard in one port and released at a different port poses a risk of introducing noxious/invasive aquatic nuisance species (ANS) into Alaskan waters.

Vessels would plan to ballast loads with cargo rather than water and would use minimal amounts of freshwater for ballast. Use of fresh water ballast would allow for removal of ballast within transporting marine aquatic invasive organisms. Ballast water discharge operations would be conducted in compliance with guidance provided under 33 C.F.R. Part 151 (Vessels Carrying Oil, Noxious Liquid Substances, Garbage, Municipal or Commercial Waste and Ballast Water) and 46 C.F.R. Subpart 162.060 (Ballast Water Management Systems) as last revised in 2012, and the USCG’s Navigation and Vessel Inspection Circular 07-04, Change 1, dated October 29, 2004. These regulations set forth a limited number of acceptable ballast water management methods.

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### 5.1.3 Fouled Hulls, Anchors, Rudders, and Propellers

Hull fouling is a common pathway for introductions of aquatic noxious/invasive species. The growth and accumulation of unwanted organisms on surfaces such as the hulls and other submerged parts of vessels can transport and introduce undesired invasive organisms. Fouled boat hulls (commercial and recreational), fishing gear (including felt-soled waders), and other equipment transported between waterways can carry invasive species.


Vessel operators are also required to remove “fouling organisms from hull, piping, and tanks on a regular basis and dispose of any removed substances in accordance with local, state, and federal regulations” (33 CFR 151.2035(a)(6)). Adherence to the USCG 33 CFR 151 regulations would minimize the likelihood of Project-related vessel traffic introducing aquatic invasive species.

### 5.1.4 Hydrostatic Testing

Wherever practicable, test water would not be discharged into a watershed other than its origin.

### 5.1.5 Work Camp Operations

Catering subcontractors would be required to properly manage and dispose of wastes that could attract rats. If rats are observed on any Project site, traps and rodenticide baits would be used to eradicate the rats.

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## 6.0 OTHER PREVENTATIVE STRATEGIES

The Hazard Analysis and Critical Control Point (HACCP) planning process (USFWS, 2011) would be used for areas where invasive species are likely to be introduced or spread. HACCP planning is a management tool that provides a structured method to identify risks and implement procedures that are being successfully used in natural resource pathway activities. Understanding pathways and developing plans to reduce the spread of non-target species and prevent biological contamination is necessary to avoid unintended spread of species.


The HACCP process features five integrated steps that can reduce the risk of spreading invasive species and other non-targets via human-based pathways. HACCP examines activities to determine if and when particular invasive species might be unintentionally moved. Where this potential exists, the tool helps to identify the most effective opportunities during an activity to reduce that risk and the specific control measures that are needed. Safeguards are included through the use of prescribed ranges, limits, or criteria and corrective actions that ensure that control measures are operating as intended.

### 6.1 FIVE STEPS TO HACCP PLANNING

There are five steps to HACCP planning:

1. Describing the activity: The activity description includes specific information such as who, what, when, where, how, and why of the project. The description offers a historical, working reference to facilitate plan review and communication with the facility staff and other resource management agency personnel.
2. Charting the flow of tasks for the activity: This step provides an important visual tool that the HACCP team can use to complete the remaining steps of the plan. Here, a clear and concise, yet complete description of the tasks necessary to complete the overall activity is diagramed in a linear fashion.
3. Identifying potential non-targets: Any species that has a reasonable potential to be moved or introduced to new habitats should be identified to implement appropriate control measures to prevent an unintended invasion. These may include vertebrates, invertebrates, plants, or other organisms (e.g., diseases, pathogens, and parasites).
4. Analyzing non-targets: It is crucial to identify significant non-targets with respect to each required task within a larger activity so that effective measures to control them may be employed. During the analysis, the significance of each potential non-target is assessed by considering risk.
5. Completing the action plan: The action plan addresses specific methods to control risks of non-target species. It lists specific information about controls, monitoring procedures, methods for evaluation, and corrective actions.

Each of the above steps corresponds to a specific form in the HACCP process, and each step builds on prior steps. Blank HACCP forms that would be used to complete this analysis for areas along the proposed construction corridor where invasive species are likely to be introduced or spread are included in Appendix A of this document.

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## 7.0 INSPECTION AND RECORDKEEPING PROCEDURES

The Contractor would be responsible for recording and maintaining documentation associated with the procurement, storage, handling, and application of herbicides.

### 7.1 INSPECTION AND EQUIPMENT MAINTENANCE

Environmental Inspectors would note if any issues with noxious/invasive species are identified and would ensure implementation of the appropriate protection measures in agreement with this Plan.

Pesticide application equipment would be in good working order and maintained or repaired as needed to ensure proper operation at all times.


Pesticide application equipment would be inspected for leaks and calibrated to ensure proper dosage on a daily basis. These inspections would be documented via daily checklists.

Procurement, storage, and transport of herbicides would be done in accordance with the procedures and reporting requirements of the Project *SPCC Plan*.

### 7.2 QUALITY ASSURANCE/QUALITY CONTROL INSPECTION AND AUDITS

The Environmental Inspectors would oversee all herbicide applications to ensure compliance with this Plan and the Project *SPCC Plan*. The Environmental Inspector daily inspection reports would document herbicide application locations, quantities, and verification of proper herbicide storage, handling, and application procedures.


The Environmental Inspectors would periodically audit the Contractor's performance with this Plan.

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## 8.0 TRAINING


As part of Environmental Training for the Project, construction staff would be trained on species identification, known sensitive areas, and general protection measures in accordance with this Plan. Training would be specific to the type of duties carried out by the group being trained (e.g., ROW preparation crew; marine construction crew) and would include the University of Alaska at Fairbanks Cooperative Extension Service online training titled, Controlling Invasive Plants in Alaska.



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## 9.0 ACRONYMS AND TERMS

Term	Definition
AAC	Alaska Administrative Code
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AKEPIC	Alaska Exotic Plant Information Clearinghouse
ANS	aquatic nuisance species
ARRC	Alaska Railroad Corporation
AS	Alaska Statute
BLM	Bureau of Land Management
C.F.R.	Code of Federal Regulations
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
GTP	Gas Treatment Plant
HACCP	Hazard Analysis and Critical Control Point
PBTL	Prudhoe Bay Gas Transmission Line
PBU	Prudhoe Bay Unit
PTTL	Point Thomson Gas Transmission Line
PTU	Point Thomson Unit
ROW	right-of-way
SPCC	Spill Prevention, Control, and Countermeasure
TAPS	Trans-Alaska Pipeline System
U.S.	United States
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Services


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## 10.0 REFERENCES

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- Greenstein, C., and H. Cortés-Burns. 2013b. Invasive Plant Management Guidance, McGrath, AK. Prepared for the Bureau of Land Management – Anchorage Field Office. Alaska Natural Heritage Program, University of Alaska Anchorage, AK. 34 pp. Available online at: <http://aknhp.uaa.alaska.edu/botany/akepic/publications/>. Accessed May 22, 2015.
- United States Fish and Wildlife Service (USFWS). 2011. Standard Guide for Conducting Hazard Analysis & Critical Control Point (HACCP) Evaluations to Prevent the Spread of Invasive Species. Available online at: <http://www.haccp-nrm.org/> . Accessed April 24, 2015.

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**Appendix A**  
**Site-Specific HACCP Forms**

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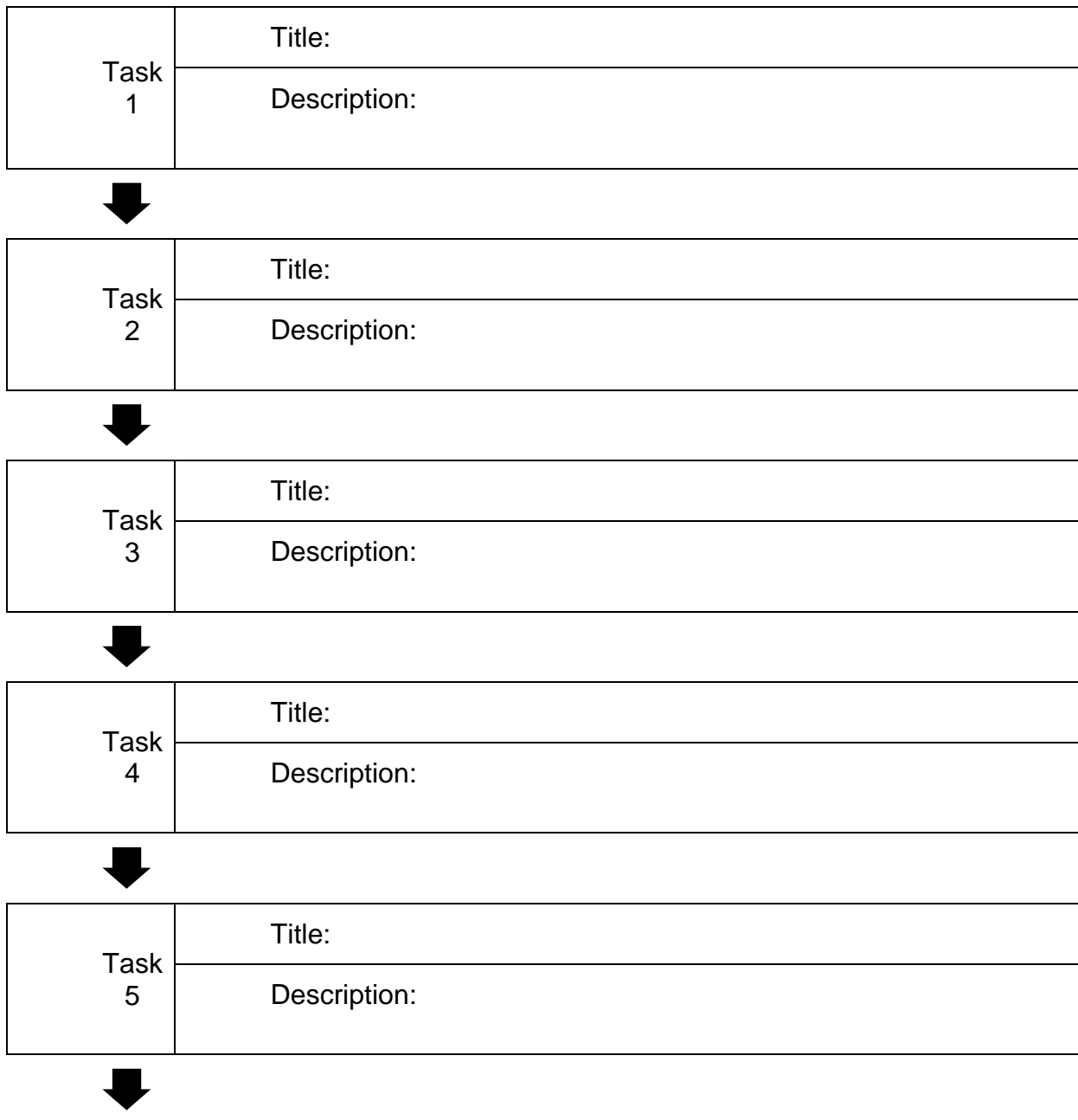
## HACCP Step 1 – Activity Description

<b>Management Objective &amp; Contact Information</b>	
HACCP Plan Title	
Management Objective:	Contact Person:
	Phone:
	Email:

<b>Activity Description</b>
i.e. Who; What; Where; When; How; Why

## HACCP Step 2 – Activity Flow Chart

### Outline Sequential Tasks of Activity




Task 6	Title:
	Description:



Task 7	Title:
	Description:

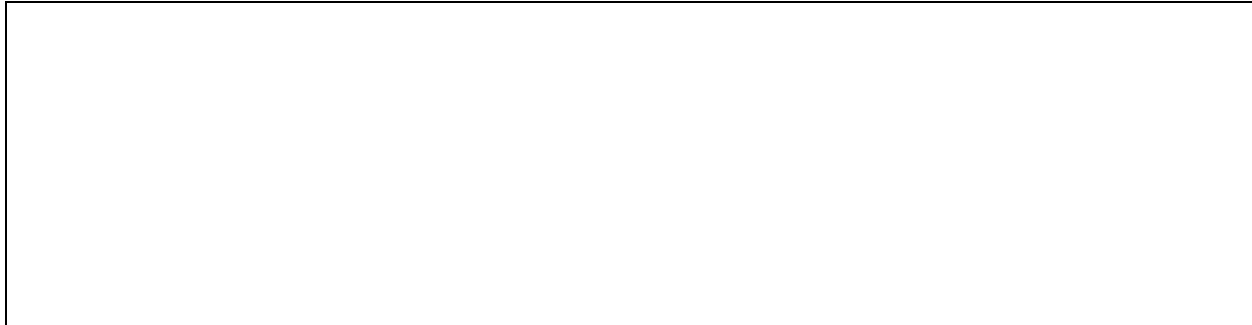


Task 8	Title:
	Description:

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### HACCP Step 3 – Identify Potential Non-Targets

Non-Targets That May Potentially Be Moved/Introduced
<p><b>Vertebrates:</b></p>
<p><b>Invertebrates:</b></p>
<p><b>Plants:</b></p>
<p><b>Other Organisms</b> (pathogens, parasites, etc.):</p>



### HACCP Step 4 – Non-Target Analysis Worksheet


1	2	3	4	5	6	7
<b>Tasks</b>  (From Step 2)	<b>Potential Non-targets</b>  (From Step 3)	<b>Risk Assessment</b>  Are any non-targets significant?  Yes or No	<b>Justification</b>  Justify your answer in Column 3	<b>Control</b>  What control measures can be applied during this task to reduce the risk of non-targets?	<b>CCP?</b>  Is this task a CCP?  Yes or No	<b>Justification</b>  Justify your answer in Column 6

Task # ____  Title:	Vertebrates					
	Invertebrates					
	Plants					
	Others					



Task # ____  Title:	Vertebrates					
	Invertebrates					
	Plants					
	Others					


Task # ____  Title:	Vertebrates					
	Invertebrates					
	Plants					
	Others					

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*Each form has room for only three tasks. Please duplicate this blank form as many times as necessary so that you may include all tasks.*

### HACCP Step 5 – Non-Target Risk Action Plan (NTRAP)

(Use this form for any "Yes" from Column 6 of HACCP Step 4 - Non-Target Analysis Worksheet)										
One page for each Critical Control Point										
<b>Management Objective</b> From Step 1										
<b>Critical Control Point: Task #</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; padding: 5px;"><b>Title:</b></td> <td style="background-color: #f2f2f2;"></td> </tr> </table>	<b>Title:</b>								
<b>Title:</b>										
<b>Significant Non-Target(s)</b> (Step 4, Column 3)										
<b>Control Measure(s)</b> (Step 4, Column 5)										
<b>Prescribed ranges, limits, or criteria for control measure(s):</b> (PRLC)										
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="4" style="width: 30%; padding: 5px; vertical-align: middle;"> <b>Monitoring the Control Measure(s)</b> </td> <td style="padding: 5px; text-align: center;"><b>Who?</b></td> <td style="background-color: #f2f2f2;"></td> </tr> <tr> <td style="padding: 5px; text-align: center;"><b>How?</b></td> <td style="background-color: #f2f2f2;"></td> </tr> <tr> <td style="padding: 5px; text-align: center;"><b>Where?</b></td> <td style="background-color: #f2f2f2;"></td> </tr> <tr> <td style="padding: 5px; text-align: center;"><b>How often?</b></td> <td style="background-color: #f2f2f2;"></td> </tr> </table>	<b>Monitoring the Control Measure(s)</b>	<b>Who?</b>		<b>How?</b>		<b>Where?</b>		<b>How often?</b>		
<b>Monitoring the Control Measure(s)</b>		<b>Who?</b>								
		<b>How?</b>								
		<b>Where?</b>								
	<b>How often?</b>									
<b>Corrective Action(s) if Control Measures Fail</b> (or PRLC cannot be met)										
<b>Supporting Documents</b> <i>(For example, Management Plan, Checklist, Decontamination Techniques, SOPs, Scientific Journal Articles, etc.)</i>										

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<b>Development Team Members</b>			
<b>Date Developed:</b>		<b>Date(s) Reviewed:</b>	

*\* all gray fields are required*

*Each form has room for only one Critical Control Point. Please duplicate this blank form as many times as necessary so that you may include all CCPs.*