

Exponent™

**Institutional Control Plan
for the Ketchikan Pulp
Company Site**

Prepared for

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Acronyms and Abbreviations

ADEC	Alaska Department of Environmental Conservation
ARAR	applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CoC	chemical of concern
CoPC	chemical of potential concern
Easement and Covenant	<i>Environmental Protection Easement and Declaration of Restrictive Covenants</i>
EPA	U.S. Environmental Protection Agency
Gateway	Gateway Forest Products
KPC	Ketchikan Pulp Company
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCDD/F	polychlorinated dibenzo- <i>p</i> -dioxin and polychlorinated dibenzofuran
ROD	record of decision
RPM	remedial project manager

1. Introduction

This plan describes the institutional controls for the Uplands Operable Unit of the Ketchikan Pulp Company (KPC) site, which was purchased by Gateway Forest Products (Gateway) in November 1999. Institutional controls are measures undertaken to limit or prohibit activities that may interfere with the integrity of a remedial action or potentially result in exposure to unacceptable levels of hazardous substances at a site. Institutional controls are legal or administrative controls, as opposed to engineering controls, and are not typically the sole remedy. At the Uplands Operable Unit, institutional controls were applied after the early actions to remove principal threats at the site were completed. Examples of institutional controls include legal or administrative controls for managing contaminated soil during development activities and property deed restrictions (e.g., to restrict the land use of a property). The intent of institutional controls is to ensure that remedial efforts are protective of human health and the environment over the long term. The use of institutional controls and the early actions conducted at the Uplands Operable Unit were presented to the public in the proposed plan (ADEC and U.S. EPA 1999) and will be documented in the record of decision (ROD), with consideration of any applicable public comments.

The former KPC site is located approximately 5 miles north of Ketchikan, Alaska (Figure 1), and is divided into two administrative units: the Marine Operable Unit and the Uplands Operable Unit. The Marine Operable Unit is being remediated under a consent decree with the U.S. Environmental Protection Agency (EPA) and includes all of Ward Cove and other marine areas where there has been migration of hazardous substances from Ward Cove or the Uplands Operable Unit in concentrations that potentially pose a threat to public health or the environment. The Uplands Operable Unit is being remediated under a consent order with joint oversight from EPA and the Alaska Department of Environmental Conservation (ADEC) and includes the pulp mill area (including the dredge spoil area), the wood waste and ash disposal landfill, and the former storage areas along the water pipeline road (pipeline road). The Uplands Operable Unit also includes other land-based areas that may have been affected by pulp mill operations (i.e., areas that received aerial deposition from the mill and residences where mill solids may have been used as soil amendments) (Figure 2). The boundary between the two operable units is defined as the mean higher high tide level.

The institutional controls described in this plan for the pulp mill area of the Uplands Operable Unit and institutional controls for the Marine Operable Unit are codified in the *Environmental Protection Easement and Declaration of Restrictive Covenants* (Easement and Covenant) document filed between KPC and the State of Alaska Department of Natural Resources for ADEC, with provisions for designating oversight authority to EPA (ADL 1999). The Easement and Covenant document is attached as Appendix A. Appropriate easement and covenant documents will also be prepared relating to

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institutional controls for the wood waste and ash disposal landfill area and for the disposal areas along the pipeline road.

This institutional control plan applies only to the Uplands Operable Unit and addresses only contamination related to KPC's former use of the property. The investigation and remediation of the Marine Operable Unit are being conducted on a separate schedule from the Uplands Operable Unit. The Easement and Covenant document and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) Consent Decree contain provisions for replacing the cap in those areas of the Marine Operable Unit to be capped by clean sediments in the event that any projects or activities cause large portions of the cap to be displaced or eroded. No additional institutional controls or other restrictions for the Marine Operable Unit are anticipated, but if any are identified, they will be addressed separately after the remedy for that unit is selected.

This institutional control plan is to be implemented by the owner(s) of the properties to manage residual contamination as a result of KPC's use of the site. Specifically, the institutional controls are specified in the Easement and Covenant document and the CERCLA Consent Decree, which stipulate management methods for contaminants of concern and areas of concern identified in the KPC remedial investigation and feasibility study or for these contaminants in any areas that might be identified in the future. This plan addresses characterization, management, and disposal of soils in the following areas: soils in the near-shore fill subarea, soils underneath paved areas or structures at the former pulp mill site, and soils at the former pulp mill and at the pipeline road area that were not evaluated¹ or characterized during the remedial investigation but that could be exposed in the future (e.g., as the result of excavation or demolition).

These institutional controls are conferred with the land regardless of the owner. The KPC former mill property was sold to Gateway effective November 1, 1999, for use as a light manufacturing facility. Gateway and any successor will have responsibility for implementing this institutional control plan for the pulp mill property. As part of the sale agreement between KPC and Gateway, a cost and work sharing arrangement has been formalized between the two parties. The agreement contains specific requirements for Gateway and any successors to provide KPC prior notice of any activities that are likely to expose historical contamination and to notify KPC if contamination is discovered; describes how the costs and responsibilities for investigating and managing the contamination will be shared between the two parties; and allocates responsibilities for directing any remedial efforts. In addition, Gateway and any subsequent owners will have responsibility for following all applicable laws including appropriate management of any chemicals used onsite.

¹ The remedial investigation for the upland site evaluated the entire site, but characterization through sampling and analyses was done only in areas where contaminant releases were suspected.

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There are no plans for sale of the landfill property at this time. However, if the landfill property is purchased by another entity, then the ADEC solid waste permit for the landfill could be transferred to the new owner through an application to ADEC. Residual concentrations of chemicals of concern (CoCs) at the former storage areas along the water pipeline road are described in Technical Memorandum No. 23 (Exponent 2000a). The mostly likely future use of the pipeline road areas is recreational. Site concentrations were evaluated based on institutional use, however, because this provides a protective means to evaluate less frequent recreational exposure. During investigations of the pipeline road, five areas identified as potentially of concern were investigated: Area 1, Area 2, Drum Area 2, Area 3, and Area 4. In general, soil containing polychlorinated biphenyls (PCBs) greater than the 10 mg/kg cleanup level or lead greater than the 1,000 mg/kg cleanup level identified by EPA Region 10 was removed at all locations along with solid waste. At this time, there are three areas (Area 2, Drum Area 2, and Area 3) that have PCB concentrations greater than the 1 mg/kg cleanup level for residential soils identified by EPA. In addition, although lead concentrations were predominantly less than 100 mg/kg, Area 2 had four surface stations and two subsurface stations with detections of lead greater than 1,000 mg/kg (ranging up to 2,300 mg/kg). The subsurface stations (depths up to 12 ft) were filled to original grade with clean soil, and the entire area was covered with clean soil and seeded with grass. These areas are within a larger area that will be subject to institutional controls.

Area 1 was purchased by Gateway and is considered part of the pulp mill area, but as indicated above, this area does not have any chemicals at concentrations in excess of the residential cleanup levels. KPC is seeking ownership of Drum Area 2 and Areas 2, 3, and 4 (Figure 3). KPC will prepare an easement and covenant document to restrict residential development or digging along this entire corridor. Though there is no plan for sale of the landfill, or the areas along the pipeline road, any easement or covenant documents for these areas would be conferred with the land to any subsequent owners.

The remainder of this section provides background information regarding the KPC site and presents the purpose of this plan. Section 2 presents the objectives of the institutional controls. Section 3 presents the development of the institutional controls for the Uplands Operable Unit. Section 4 presents the record-keeping procedures for tracking activities related to the institutional controls. In addition, there are four documents included as appendices. Appendix A contains the Easement and Covenant document. Appendix B presents a sampling and analysis plan for future demolition/construction activities at the Uplands Operable Unit. Appendix C contains a list of screening levels derived by EPA Region 9 for industrial soils. Appendix D contains a plate depicting the areas that have been sampled at the KPC site.

1.1 Background

This section presents a summary of background information for the Uplands Operable Unit. Additional information regarding the site is included in the remedial investigation report (Exponent 1998e).

KPC operated a pulp mill at the site from its construction in 1954 until shutdown in 1997. The KPC landfill began operation in 1988 and has been used for the disposal of wood waste, flyash, and recovery and wood waste boiler bottom ash. In 1997, a consent order between KPC, Louisiana-Pacific Corporation, ADEC, and EPA was issued to address site contamination. The consent order required KPC to conduct a remedial investigation and clean up CoCs) found at levels determined to be a threat to human health or the environment.

The remedial investigation confirmed the presence of chemicals of potential concern (CoPCs) in soil at the site. The CoPCs were arsenic, lead, manganese, polycyclic aromatic hydrocarbons (PAHs), polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzofurans (PCDDs/Fs), PCBs, and petroleum hydrocarbons (Table 1). After comparison with screening values and calculation of risk estimates, arsenic, lead, PAHs, PCBs, and petroleum hydrocarbons were identified as CoCs requiring consideration of remedial actions. To identify areas that exceed acceptable risk levels, a decision framework was developed together with EPA and ADEC, which is summarized below:

- **Incremental cancer risks are less than 1 in 100,000 (1×10^{-5}) and/or the hazard indices for noncancer adverse effects are less than 1—** No further action will be considered.
- **Incremental cancer risks are between 1 in 100,000 (1×10^{-5}) and 1 in 10,000 (1×10^{-4}) for cumulative risk and/or cumulative hazard indices for noncancer adverse effects are between 1 and 10—** Development of cleanup options will be considered but may not be required. The remedial project managers (RPMs) will consider additional factors other than only a numerical exceedance of these decision risk levels in deciding on the need for further assessment.
- **Incremental cancer risks are greater than 1 in 10,000 (1×10^{-4}) for pathways or for cumulative risks and/or hazard indices for noncancer adverse effects are greater than 10—**Cleanup options will be developed for this area/pathway (i.e., this area will be carried into a feasibility study unless it is addressed by early action).

During and immediately after the remedial investigation, early actions involving sampling and removal of contaminated soil were completed for the areas identified as having unacceptable risk levels for industrial and commercial uses. Additional areas were remediated as part of plant upgrades during closure, thereby also reducing concentrations of arsenic and PCDDs/Fs in site soils and sediments (i.e., access road ditch). These areas, the CoCs, and their screening levels are listed in Table 2 and shown on Figure 4. Completion of the early actions has resulted in surface soil (i.e., soil that is not covered by paving or buildings) at the mill site and pipeline areas meeting acceptable risk levels for industrial/commercial exposure scenarios. As described above, these exposure levels would also be protective for expected future recreational use of the pipeline road areas.

During the remedial investigation, it was determined that the potential site-related sources of arsenic (limited application of arsenical pesticides at Thorne Bay, possible use of rodenticides) did not fully account for the observed concentrations of arsenic onsite, (i.e., from undetected at 0.5 mg/kg to 670 mg/kg at the paint shop with widespread detections exceeding 50 mg/kg in many pulp mill areas). Moreover, similar concentrations were found in many offsite locations. Specifically, offsite concentrations ranged from undetected at 0.5 mg/kg in forest soil to 207 mg/kg at a gravel driveway near Wards Cove Cannery to more than 4,000 mg/kg at a local quarry. Onsite risk estimates for future workers exposed to arsenic in soil via ingestion and dermal contact ranged from 5×10^{-6} for the former bottom ash storage pile to 2×10^{-4} for paint shop soils with a number of other areas having risk estimates for arsenic between 1×10^{-5} and 5×10^{-5} (Table 1). The risk estimate for offsite residents in aerial deposition areas exposed to arsenic in soil via ingestion, dermal contact, and consumption of homegrown produce was 2×10^{-5} .

Additional investigations identified local rock quarries as a major source of onsite arsenic and determined that the arsenic present in soil is not readily absorbed from soil if ingested (i.e., the arsenic was identified as having low bioavailability), thus reducing possible exposure. These findings, together with procedures for safe use of arsenic-containing rock materials, were documented in an arsenic management plan (Exponent 1998d). EPA and ADEC reviewed this information and determined that soil with arsenic concentrations resulting in mid-range risk decision levels (i.e., incremental cancer risks between 1×10^{-5} and 1×10^{-4} and hazard indices between 1 and 10) could be left in place. EPA, ADEC, and KPC also determined that the procedures identified in the arsenic management plan to reduce exposure and risks (Exponent 1998d) should be applied at the site and made available to the community.

Concurrent with the remedial investigation, KPC conducted closure activities for the wood waste and ash disposal landfill in accordance with the solid waste permit administered by ADEC and all applicable regulations. Landfill closure activities conducted in 1997 and 1998 consisted of constructing a low-permeability cover system, including a geomembrane, over the landfill; placing a topsoil cover and vegetation on the landfill; constructing surface water drainage improvements throughout the landfill; and constructing a leachate treatment system adjacent to the landfill. A new cell was constructed in 1997 and is permitted (ADEC Solid Waste Permit No. 9713-BA001) to receive boiler bottom ash, flyash, and smaller volumes of wood waste, rock, and dirt, secondary sludge, and dredge spoils.

Upon completion of the remedial investigation in 1998, ADEC and EPA issued a proposed plan for the Uplands Operable Unit (ADEC and U.S. EPA 1999) that identified a preferred remedial action. Based on public comment on the proposed plan, the final remedies were stipulated in the ROD (ADEC and U.S. EPA 2000). The selected remedial actions for the pulp mill area and pipeline road areas include the following activities:

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- Complete all early actions
- Implement institutional controls
- Continue to use the controls specified in the arsenic management plan (Exponent 1998d)
- Conduct sampling and evaluation during future demolition activities that result in exposure of soils not evaluated in the remedial investigation
- Establish a procedure to ensure that if, in the future, soils from the near-shore fill subarea or contaminated soils underneath paved areas or structures are excavated, those soils will be properly characterized and managed.

The preferred remedial action for the wood waste and ash disposal landfill includes the following activities:

- Close the remaining cell of the wood waste and ash disposal landfill in a manner similar to that of the other cells, which KPC has already closed (i.e., in accordance with the ADEC solid waste permit and all applicable regulations)
- Conduct long-term monitoring at the landfill in accordance with all applicable permits
- Implement institutional controls.

As previously mentioned, the early actions at the pulp mill and pipeline road have been completed. This institutional control plan addresses the other components of the preferred remedial action for the pulp mill and pipeline road areas. For the wood waste and ash disposal landfill, the remaining cell will be closed in the same manner as the other cells. In addition, long-term monitoring and institutional controls will be implemented in accordance with the ADEC solid waste permit, applicable ADEC solid waste regulations, and any National Pollutant Discharge Elimination System (NPDES) permit that may be in place at the time. Some landfill monitoring requirements are now being fulfilled through the existing NPDES permit for the Ward Cove facility. If the property owners request a permit modification or reissuance in the future, EPA and ADEC will be provided 30 days notice of any proposed changes to the landfill monitoring requirements. These institutional controls will also be a part of the CERCLA ROD for the site. This institutional control plan summarizes the institutional controls for the wood waste and ash disposal landfill.

1.2 Purpose of the Institutional Control Plan

The intent of the institutional controls is to ensure that remedial efforts are protective of human health and the environment over the long term at the KPC site. Institutional controls are part of the preferred remedial action for the Uplands Operable Unit to prevent residential use. These requirements are specified in the Easement and Covenant document for the pulp mill area and are conveyed with the property (regardless of the owner) until soil concentrations reach acceptable site-specific, risk-based concentrations for residential use or appropriate regulatory levels, or until 2099, whichever occurs first. Prior to 2099, the parties will evaluate the need to continue institutional controls beyond 2099. Covenants to stipulate appropriate controls for the wood waste and ash disposal landfill and the former disposal area along the pipeline road are in development. Although soil concentrations of CoCs are lower or within the acceptable range for industrial use as determined in the risk assessment (Table 1), concentrations in some areas of the KPC site are higher than risk-based concentrations identified for residential land use.² The institutional controls for the KPC site have several purposes:

- To address specific areas of the Uplands Operable Unit (i.e., the wood waste and ash disposal landfill) that are known to have CoCs in soil at concentrations greater than risk-based concentrations considered to be protective for residential use and that require ongoing maintenance or other controls to limit exposure and risk
- To address specific areas of the Uplands Operable Unit (e.g., the near-shore fill subarea and areas under buildings or structures) that may require characterization and or remediation if they are exposed during demolition or excavation activities
- To address area-wide concerns (i.e., the paint shop and much of the mill area and some areas along the pipeline road) regarding appropriate use of the site (e.g., maintaining industrial/commercial zoning for the site because of the CoCs present in soil at concentrations higher than those considered to be protective of residential use).

This institutional control plan will ensure coordinated and reliable implementation and maintenance of the institutional controls for the Uplands Operable Unit. It will also ensure that the objectives of land use restrictions or controls are being achieved and that

² Risk-based concentrations for soils were taken from EPA Region 3 and Region 9 and were derived using a target risk level of 1×10^{-6} and conservative assumptions based on contact with contaminants in soil in a residential or industrial setting. As indicated above, although arsenic concentrations in soil are within the mid-range of risk decision levels (i.e., higher than EPA risk-based concentrations for industrial soils), EPA and ADEC have agreed that it is appropriate to leave the soil in place because of demonstrated low bioavailability and because the arsenic is associated with native rock.

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the tools and procedures that the facility uses to implement restrictions/controls are in place. In addition, this plan describes controls for areas where future excavations may modify site risks (e.g., the near-shore fill subarea and areas under roads and buildings).

To fulfill these goals, the institutional control plan:

- Develops appropriate institutional controls for the pulp mill site and areas along the pipeline road to maintain adequate short- and long-term protection of human health and the environment
- Summarizes the institutional controls for the landfill that are being conducted in accordance with the ADEC solid waste permit, applicable ADEC regulations, and any NPDES permit in place at the time.
- Identifies procedures for implementing the institutional controls, including procedures for tracking activities related to the institutional controls
- Serves as a one-source reference for other related activities, documents, and permits (however, this institutional control plan does not supersede any regulatory or permit requirements).

2. Institutional Control Objectives

Soils at the pulp mill area and pipeline road that contained chemicals at unacceptable risk levels for industrial/commercial use have been removed through early actions at the site. However, residual concentrations of chemicals remain in soils at the pulp mill area and at areas along the pipeline road above EPA risk-based concentrations for residential land use. EPA guidance regarding land use in the CERCLA remedy selection process states the following:

The volume and concentration of contaminants left on-site, and thus the degree of residual risk at a site, will affect future land use. For example, a remedial alternative may include leaving in place contaminants in soil at concentrations protective for industrial exposures, but not protective for residential exposures. In this case, institutional controls should be used to ensure that industrial use of the land is maintained and to prevent risks from residential exposures. (U.S. EPA 1995)

The near-shore fill subarea was characterized during the site investigation, and no contaminants were found at levels exceeding applicable risk-based concentrations. In addition, migration of contaminants to Ward Cove was ruled out through evaluation of the potential volume of dissolved contaminants that could reach Ward Cove³ and sampling results from Ward Cove. Due to the past use of the area as a fill area, however, there is uncertainty as to whether chemicals are present in soils in areas that were not directly characterized. Similarly, there is uncertainty about soils beneath the paved areas and structures at the mill because these areas were not sampled during the remedial investigation. Soils at the pipeline road were sampled where contamination was suspected, but some uncertainty remains regarding areas that were not sampled. Therefore, uncharacterized soils at the pipeline road and in the nearshore fill subarea and soils beneath paved areas and structures remaining at the pulp mill area will need to be further evaluated to determine the need for sampling if soils are exposed during

³ PCB (Aroclor[®] 1254) was measured at concentrations (0.49 $\mu\text{g/L}$) near the analytical detection limit in unfiltered water in one of three test pits in the near-shore fill subarea. Only the dissolved portion would be able to migrate into Ward Cove. The dissolved portion in the groundwater was estimated to be approximately 0.013 $\mu\text{g/L}$, which is less than the ecological screening criterion of 0.030 $\mu\text{g/L}$ in marine waters. PCB was therefore not considered a CoPC for ecological receptors. The EPA proposed PCB criterion for protecting human health (from fish consumption) is extremely low (i.e., 0.00017 $\mu\text{g/L}$) and is actually below analytical detection limits for PCBs (i.e., Aroclors[®]). Nevertheless, the potential for transport of PCBs from the groundwater into Ward Cove was evaluated. PCBs would be carried out into Ward Cove during ebbing tides and mixed with seawater along the shoreline of the near-shore fill subarea. Using conservative assumptions, PCB concentrations are predicted to be less than the proposed criterion of 0.00017 $\mu\text{g/L}$ within 0.1 m of the shoreline. Because of the very low (probably less than background) concentrations and limited area of potential impact, PCBs are not considered CoPCs for human health for this pathway.

demolition or excavation activities. The institutional controls described in a subsequent section of this document address sampling and evaluation of soil for demolition activities at the pulp mill area and the pipeline road. In addition, the institutional controls address procedures for properly characterizing and managing excavated soils.

Closure and monitoring of the wood waste and ash disposal landfill in accordance with the ADEC solid waste permit and ADEC regulations, including institutional controls, is consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and the EPA NPDES permit. The NCP states that EPA expects to use engineering controls, such as containment, for waste that poses a relatively low long-term threat and to use institutional controls such as water use and deed restrictions to supplement the engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous substances, pollutants, or contaminants (40 CFR 300.430(a)(1)(iii)).

ADEC regulations also include requirements for institutional controls. In general, ADEC may require institutional controls on a site-specific basis where they are necessary to protect human health, safety, or welfare or the environment. The institutional controls may include deed restrictions or other measures that would be examined during a routine title search and that limit site use or site conditions over time or provide notice of any residual contamination. ADEC regulations that address institutional controls include 18 AAC 75.350(2)(C), 18 AAC 75.375, and 18 AAC 75.990 (54).

Based on the regulations and requirements presented above, the conditions at the Uplands Operable Unit, and the preferred remedial action presented in the proposed plan, the objectives for the institutional controls for the pulp mill site and the pipeline road are as follows:

- Maintain acceptable risk levels for soils for industrial/commercial exposure scenarios (which will also be protective of recreational use of the pipeline road)
- Comply with requirements identified in the *Management Plan for Arsenic in Rock and Soil* (Exponent 1998d) to reduce exposure to arsenic in soil and rock
- Restrict residential land use (or similar non-industrial/commercial land use resulting in around-the-clock residence by people or daily use by children)
- Prohibit drilling of water wells and use of groundwater
- Identify and address source areas (if any) during demolition and excavation activities using applicable or relevant and appropriate requirements (ARARs) such as current risk-based concentrations or standards and criteria

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- Properly characterize and manage soils from the near-shore fill subarea or underneath paved areas or structures and from other locations not evaluated or characterized in the remedial investigation if those soils are excavated.

The objectives for the institutional controls for the wood waste and ash disposal landfill are to fulfill the requirements of any permits (e.g., the ADEC solid waste permit and the EPA NPDES permit) that may be active and in force at the time. Additional objectives are to restrict future use of the landfill property to preclude any of the following:

- Use of groundwater
- Activities that could result in exposure to landfill materials
- Activities that could compromise the integrity of the landfill cap, the leachate treatment system, or any ancillary equipment.

3. Development of Institutional Controls

Institutional controls are developed in this section for the pulp mill area, the pipeline road areas, and wood waste landfill to ensure that the objectives in the previous section are met. Consistent with the Easement and Covenant document (ADL 1999), the institutional controls will remain in place until 2099, or until site CoCs no longer exceed site-specific, risk-based residential cleanup levels, whichever comes first. The Easement and Covenant document allows for oversight by EPA and ADEC, in decisions regarding any future revisions to the controls to be determined by these agencies and the current owner. Project managers with EPA and ADEC may also identify and initiate appropriate changes to this institutional control plan to be consistent with future regulatory changes or changes in land use.

3.1 Institutional Control Program Administration

Respective roles of organizations responsible for administering the institutional control program are listed in Table 3 with their phone numbers and addresses. These organizations include KPC, Gateway, or subsequent owners (and other parties under the direction of site owners including contractors), the Ketchikan Gateway Borough, and appropriate regulatory agencies. KPC will be responsible for the institutional controls for the landfill property as long as KPC owns that property. There are no plans for sale of the landfill property at this time. Gateway and any successors will be responsible for institutional controls for the pulp mill property. A plan for institutional controls for the pipeline road is in development to restrict residential use of the areas with CoCs exceeding residential cleanup levels. KPC is seeking ownership of Drum Area 2 and Areas 2, 3, and 4 and will be responsible for administering institutional controls in these areas.

3.2 Pulp Mill Site and Pipeline Road

Institutional controls for the pulp mill site and for the pipeline road include zoning and deed restrictions, procedures for characterizing and managing soil during routine excavations, procedures for characterizing and managing soil during demolition activities, and notification procedures.

3.2.1 Zoning and Deed Restrictions

The Ketchikan Gateway Borough has zoned the pulp mill area for industrial use (i.e., industrial-heavy). There are no plans for the zoning designation to be revised, and it is unlikely that revision of the zoning designation would ever occur. The wood waste landfill area and the dredge spoil subarea are also zoned as industrial-heavy. No

construction is planned on the wood waste landfill area. Any construction would require substantiation that the proposed activity would not compromise the integrity of the landfill cap or leachate collection system in any manner.

As described previously, KPC and the Alaska Department of Law (ADL) prepared and filed the Easement and Covenant document for the pulp mill area. This document has been filed with the Ketchikan Gateway Borough and would be examined during a routine title search. It limits site use over time and provides notice of residual contamination on the property. KPC, along with ADL, is in the process of developing a similar document for the wood waste and ash landfill and will provide a draft of the deed restriction or other measure to ADEC and EPA for review prior to filing it. The former disposal areas along the water pipeline road are too small for residential development. Nevertheless, an easement and covenant agreement will be put into place for the pipeline road with stipulations similar to the agreement for the former pulp mill area (i.e., to prevent future residential use of this area).

3.2.2 Routine Excavations

Routine excavations are relatively minor excavations that may occur during normal maintenance or operational activities. A routine excavation is defined as an area of approximately 25 ft² or smaller or a volume of soil of approximately 3 yd³ or less, and where excavated soils will remain onsite and not be transported offsite for disposal. A routine excavation may not include removal of a paved area or structure (limited to the area formerly mentioned). It is anticipated that soil sampling will not be required as part of routine excavations unless there is visible evidence of debris or contamination, or knowledge of past or present use of the area suggests that contamination may be present. If sampling is required, it will be carried out as described in the section below and in Appendix B (and in consultation with EPA and ADEC).

If sampling is required, analytical results for soil samples will be compared with screening levels. Specifically, risk-based concentrations derived by EPA and ADEC to identify possible CoCs and background concentrations will be applied where available. For constituents other than petroleum products, the results for the soil samples will be compared to screening levels derived by EPA Region 9 for industrial soils, which were identified by EPA as the appropriate screening levels for soil (included in Appendix C). (The EPA Region 9 risk-based concentrations will be used unless EPA Region 10 no longer recommends them for use in Region 10.) For petroleum products, soil sampling results will be compared with ADEC's soil cleanup levels for the protection of nonpotable groundwater, which will be calculated consistent with ADEC guidance (18 AAC 75, ADEC [1998]) or comparable applicable requirements in effect at the time of the demolition. Any possible CoCs identified will then be evaluated in comparison with ARARs presented in the ROD for the KPC Uplands Operable Unit to determine the need for remedial actions, if any.

The landowner will notify ADEC and EPA if any soil sample results exceed screening levels or if suspect debris is found. In addition, if soil sample results exceed screening

levels, then the landowner will coordinate with ADEC and EPA, and a decision will be made on a case-by-case basis as to whether additional excavation will be conducted. If soil sample results exceed screening levels (discussed above), then EPA and/or ADEC will determine the appropriate action (i.e., offsite disposal or a screening-level risk evaluation to determine the appropriate remedy). If the soil sample results do not exceed screening levels, then the excavated soil may be placed back into the excavated area or otherwise properly disposed. Any suspect debris will be removed for appropriate disposal in accordance with applicable regulations and landfill requirements. Any imported material for backfill or other purposes must meet the requirements of the arsenic management plan (Exponent 1998d). Records will be kept of the routine excavations as described in the record-keeping section of this plan.

3.2.3 Major Excavations and Demolitions

Demolition activities such as excavations larger than those defined in *Routine Excavations*, excavations that require removal of paved areas or structures, or excavation of portions of the near-shore fill subarea or the water pipeline storage area are addressed in this section. For major excavations, an excavation-specific sampling and analysis strategy will be developed in consultation with EPA and ADEC using the following guidance and the procedures described in Appendix B. Similar to the procedure used in the remedial investigation to determine the appropriate analytes for a given area, it is recommended that the need for confirmation sample collection and analysis be determined by the history of the area's use.

Soil underneath paved areas (i.e., railroad track areas), soil underneath structures, or soil in areas where petroleum products were stored or used would be analyzed for diesel- and residual-range organics and PAHs (and gasoline-range organics and benzene, toluene, ethylbenzene, and xylenes, if appropriate). PCB analyses may also be needed depending on site characterization. Soil from the flyash silo would be analyzed for PCDDs/Fs. Soil in the near-shore fill subarea and the water pipeline storage area would be analyzed for diesel- and residual-range organics, target analyte list metals, volatile organic compounds, semivolatile organic compounds, organochlorine pesticides and PCBs, and chlorinated herbicides. The analyte list for soils in other areas will be determined in consultation with EPA and ADEC. Excavated soil will be sampled and characterized as needed for appropriate disposal in accordance with all applicable regulations and/or landfill requirements. Soil sample results will be compared with the screening levels described above to identify CoCs. Any remediation of areas with CoCs would be discussed with RPMs and would include consideration of ARARs.

The landowner will notify ADEC and EPA if any soil sample results exceed screening levels or if suspect debris is found. The landowner will coordinate with ADEC and EPA, and a decision will be made on a case-by-case basis as to whether additional excavation will be conducted. Any soil that is excavated will be sampled and characterized as needed for appropriate disposal in accordance with applicable regulations and landfill requirements. If soil sample results are below state and federal EPA soil screening and cleanup levels, then the excavated soil may be used onsite as fill material. Any suspect

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debris will be removed for appropriate disposal in accordance with applicable regulations and landfill requirements. Any imported material for backfill or other purposes must meet the requirements of the arsenic management plan (Exponent 1998d). Records will be kept of the excavation/demolition activities and onsite and offsite treatment or disposal as described in the record-keeping section of this plan.

3.2.4 Notification Procedures

The landowner will notify both ADEC (Contaminated Sites and Remediation Program) and EPA (Alaska Operations Office) by calling them at the telephone numbers listed in Table 3 or contacting appropriate agency personnel via e-mail if any of the following occur:

- Major demolition activities are planned
- Any sampling is to be conducted during major demolition
- Any soil samples collected during routine excavations or demolition activities exceed soil screening levels
- Suspect debris (e.g., buried drum or paint can) is found during routine excavations or demolition activities.

3.3 Wood Waste Landfill

The wood waste landfill is currently regulated by ADEC Solid Waste Permit No. 9713-BA001 (Figure 5). This section summarizes post-closure requirements for the landfill, including long-term restrictions and monitoring, that are included in the permit. This institutional control plan does not supersede any current or future permit requirements; it only summarizes the relevant requirements of the current permit. EPA has reviewed existing monitoring requirements and found them to be sufficient. KPC will allow at least 30 days notice of any proposed change in monitoring resulting from any future changes in permit requirements. Any permitting changes may result in the need for modifications in this plan to meet EPA requirements for institutional controls.

The ADEC solid waste permit requires long-term inspection and monitoring of the landfill. The current *Comprehensive Landfill Monitoring Plan* (KPC 1999) presents the inspections and monitoring that will be conducted throughout the post-closure care period of the landfill. Future inspections and monitoring of the landfill will be conducted in accordance with the current plan or subsequent plans that may be required for the landfill. Under the current plan, visual and surface water monitoring are conducted. Visual monitoring includes, but is not limited to, inspecting physical damage to the cover system, drainage structures, escape of waste or leachate, unauthorized waste disposal, erosion, and evidence of death or stress to fish, wildlife, or vegetation that might be caused by the facility. Surface water monitoring includes collecting water samples to

assess whether surface water leaving the site could potentially endanger public health or cause a violation of water quality standards.

Post-closure care will also include gas monitoring, leachate monitoring, maintenance of the final cover system (including prevention of tree growth on that system), maintenance of the appurtenances, operation of the passive gas venting system, and operation of the leachate collection system. Annual inspections for slippage of the cover system and for landfill subsidence will be conducted. An inventory of the volumes of landfill leachate collected and treated will be maintained.

The current NPDES permit also requires monitoring storm water at the landfill. This monitoring includes sampling and analysis of surface water in the major conveyances at the landfill. Groundwater monitoring wells have not been constructed. In general, groundwater at the landfill discharges to the small surface water drainages, all of which flow toward Refuge, "Dawson," or Ward coves. These drainages are being routinely monitored. In addition, routine monitoring of leachate provides a "worst-case" representation of potential groundwater contamination from the landfill that is not being detected by surface water monitoring (i.e., groundwater discharging directly to marine waters by underwater seeps, if occurring). Because local groundwater flow is determined by topography, contaminant transport toward the mainland (i.e., "uphill") is unlikely.

Permit requirements for deed restrictions or other measures for the landfill property include the following:

- KPC will prepare and submit to ADEC, upon closure of the facility, a survey as-built or record drawings that show the location, types, and volume of waste deposited at the facility. A copy will be provided to any purchaser or transferee at the time of property sale or lease.
- KPC will file the survey as-built or record drawings of the area as a landfill with the appropriate land records office within 60 days after the entire facility has been permanently closed to landfilling and will submit proof of such recording to ADEC.
- KPC will record a notation on the deed to the property notifying subsequent landowners of the type of waste that has been buried on the property and warning them that a water supply for drinking water purposes should not be developed. An additional notation will be made that warns subsequent owners or operators that a geosynthetic liner has been placed over the waste and that operations should be carried out in a way that does not rupture the liner. Rupture of the liner could be caused by the operation of heavy machinery or the construction of buildings or placement of any structure on the surface. In addition, an easement and covenant document similar to that developed for the pulp mill property will be prepared for the landfill.

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- The locations where waste was deposited will not be subdivided from run-on diversion systems, leachate collection systems, or the margins of geosynthetic liners; when conveyed, they will be conveyed as one parcel.
- KPC will notify ADEC in accordance with the notification and reporting procedures identified in the ADEC solid waste permit.

4. Record-Keeping

Record-keeping will include documentation of field and sampling activities, analytical results including laboratory data sheets, disposal records, notification records, a written summary of each excavation or demolition event, and notation on a site map of activities involving sampling. Records related to KPC's former activities at the site will be kept by KPC in Ketchikan or by the parent corporation, Louisiana-Pacific in Portland, Oregon. Records related to Gateway will be kept by Gateway in Ketchikan. EPA and ADEC will be notified of any change in record locations.

Documentation of soil sampling activities is described in Appendix B. For routine excavations that do not involve sampling, only the documentation listed in Appendix B that is applicable to such excavations will be recorded. All analytical results, including laboratory data sheets, will be retained for excavation and demolition activities. Available laboratory quality assurance and quality control results will also be retained. The analytical results will be retained pertaining to site characterization as well as the profiling of excavated soil for disposal. Disposal records will be retained for any soil or debris disposed offsite. The records will include the amount and type of material disposed, the date shipped, the name and address of the disposal facility, and receipts from the disposal facilities. Notification records, such as telephone contact summary sheets, of contact between the landowner and the agencies will be retained.

A brief written summary of each excavation or demolition event will be prepared to document the activities and to provide appropriate information that is not in the project documentation records. This written summary will include a summary of onsite and offsite treatment or disposal locations. The written summary will likely range from a few sentences for some routine excavation events to a page or two for more extensive demolition activities. Each excavation or demolition area will also be documented on a site map (Appendix D) in a manner that cross references the location on the site map to the written documentation in the project files.

For the wood waste and ash disposal landfill, KPC will keep records regarding landfill post-closure activities in accordance with the requirements of the ADEC solid waste permit. These records will include inspection logs, surveying results, analytical results including laboratory sheets, and notification records between KPC and the agencies.

Appendix B

Sampling and Analysis Plan

1. Introduction

This sampling and analysis plan (SAP) describes the procedures for collecting data to characterize soils exposed during future demolition/construction activities at the Uplands Operable Unit of the Ketchikan Pulp Company site in Ketchikan, Alaska (Figure B-1). The sampling methods presented in this SAP are designed to meet the needs of the institutional control plan (see main text). The institutional control plan states that if future demolition activities, such as removal of paved areas or structures or excavation of portions of the near-shore fill subarea for construction, result in the exposure of soils not evaluated as part of the Uplands Operable Unit remedial investigation or early actions, then those soils will be properly characterized and managed. Specific areas previously characterized are presented in Figure B-2 and are described in detail in the remedial investigation report (Exponent 1998) and subsequent technical memoranda (Exponent 1999a-c). The SAP will be used as a reference for conducting all soil characterization activities; however, the specific sampling approach for each excavation will be developed in consultation with the U.S. Environmental Protection Agency (EPA) and the Alaska Department of Environmental Conservation (ADEC). Field sampling and analysis procedures for soil are included in this SAP. If groundwater or tidally intruding seawater (but not transitory accumulated rainwater) is encountered during demolition activities, specific water characterization procedures will be developed with EPA and ADEC. The soil sampling and analysis procedures presented in this SAP were developed in accordance with 18 AAC 75 and 18 AAC 78.

2. Field Sampling Methods

Soil sampling and analysis will be conducted whenever demolition or excavation activities result in the exposure of soils that were not characterized during the remedial investigation or early actions. The specific sampling approach for each excavation will be developed in consultation with EPA and ADEC, but the following general guidelines, as specified in 18 AAC 75 and 18 AAC 78, should be followed. For each discrete area exposed, if the surface area of the exposed soil is 250 ft² or less, three grab samples of soil will be collected from the bottom of the excavation. For each additional 250 ft² of exposed surface area, one additional grab sample will be collected from the bottom of the excavation. The actual location of the grab samples will be determined in the field, but will be spaced in such a way as to provide an accurate representation of site-specific conditions. In addition, if visually stained or texturally different areas within the exposed area are encountered, they will be sampled separately. Samples will be collected from a depth of 0–6 in. or to bedrock if it is encountered at less than 6 in. If the excavation is greater than 4 ft in depth, one soil sample will be collected from each sidewall of the excavation. Sidewall samples will be collected, to the extent possible, over the entire depth of excavation (e.g., a grab sample will be collected from the excavation equipment bucket after the bucket has swept a sample from the entire vertical extent of the sidewall).

The following steps will be taken to minimize sample collection errors:

- All samples will be collected with disposable or clean tools that have been decontaminated as outlined in Section 2.3, *Equipment Decontamination*.
- Disposable gloves will be worn and changed between sample collections.
- Precleaned sample containers supplied by the analytical laboratory will be used.
- Sample containers will be filled quickly.
- Samples will be placed in containers in the order of volatility of the analyte; for example, volatile organic compound (VOC) samples will be taken first, followed by the semivolatile organic compound (SVOC) samples and then metal samples.
- Containers will be quickly and adequately sealed, and rims will be cleaned before lids are tightened. Tape may be used only if known not to affect sample analysis.
- Sample containers will be labeled as outlined in Section 2.2, *Sample Labeling*.

- Samples will be immediately preserved according to procedures described in Section 3, *Laboratory Analysis*. Unless specified otherwise, immediately after sample containers are filled, they will be placed on ice in a cooler at 4°C. This temperature must be maintained throughout delivery to the laboratory and until samples are analyzed.

2.1 Documentation of Soil Sampling Activities

A field logbook or other type of field record will be used to document the collection of samples and site data. This record must include the following:

- The name of each person onsite supervising or conducting the sampling
- The date and time of sampling
- Weather conditions, including temperature, wind speed, humidity, and precipitation
- The name of each person who physically collected the samples
- Clear photographs of the site, bottom of excavation, and sampling locations
- A site sketch that, at a minimum, shows the following:
 - Distances from the excavation to nearby structures
 - Sampling locations and depth and corresponding sample ID numbers
 - Any visually stained soils or texturally different materials
 - Scale
 - North arrow.

When appropriate, the field record should also include the following:

- A description of the size of the excavation
- Location of stockpiled soils
- Amount and type of backfill material
- Soil types
- Utility trenches.

2.2 Sample Labeling

Indelible, waterproof ink will be used to label sample containers. Labels must be securely fastened to the container. All information entered onto the label must be duplicated in the field logbook. Information on the label must include the following:

- Unique identifying number (sample ID number) assigned to the sample for laboratory analysis
- Date and time of sample collection
- Name of person collecting the sample
- Each intended laboratory analysis for the sample
- Preservative (if applicable).

A chain-of-custody form(s) will accompany each shipment of samples to the analytical laboratory. The chain-of-custody form will contain sample ID number, date and time of collection, and requested analysis for each sample. The field team leader will also be identified. The chain-of-custody form will be completed in triplicate, with the original form sent to the laboratory along with the samples and one copy retained by the field team leader.

2.3 Equipment Decontamination

All sampling equipment must be decontaminated prior to sampling and between sampling locations. Clean, solvent-resistant gloves and appropriate protective equipment must be worn by persons decontaminating tools and equipment. At a minimum, soil sampling tools must be cleaned and decontaminated by scrubbing in an Alconox[®] (or equivalent laboratory-grade detergent) solution with a stiff brush, rinsing twice with clean site water, and finally rinsing with distilled or deionized water. If free product or highly contaminated soils are encountered during sampling, an appropriate solvent should be used to remove heavy residues from the sampling equipment, followed by the cleaning steps described above.

Wastewater and rinsate solutions must be collected in appropriate containers and disposed of properly in accordance with federal, state, and local regulations.

2.4 Health and Safety

All sampling activities will be conducted in accordance with both the current owner's and the sampling contractor's health and safety plans.

3. Laboratory Analysis

An excavation-specific set of analytes will be developed in consultation with EPA and ADEC; however, the following analytes are suggested for specific areas of the site. Soil underneath paved areas (i.e., railroad track areas) or other areas where petroleum products were stored or used will be analyzed for diesel- and residual-range organics and polycyclic aromatic hydrocarbons (PAHs) (and gasoline-range organics and benzene, toluene, ethylbenzene, and xylenes, if appropriate). Soil underneath structures will be analyzed for diesel- and residual-range organics, PAHs, and polychlorinated biphenyls (PCBs). Soil from the flyash silo will be analyzed for polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzofurans. Soil in the near-shore fill subarea and the water pipeline storage area will be analyzed for diesel- and residual-range organics, target analyte list metals, VOCs, SVOCs, organochlorine pesticides and PCBs, and chlorinated herbicides. The analyte list for soils in other areas will be determined in consultation with EPA and ADEC. All analyses will be conducted in accordance with EPA, ADEC, American Society for Testing and Materials, or equivalent methods. The analytical methods presented in Table B-1, or updated versions of these methods, should be used if applicable. Sample preservation and handling requirements for these methods are also presented in Table B-1.

4. Data Reporting

For each characterization effort, a brief memorandum will be prepared after receipt of analytical results from the laboratory. The memorandum will contain a description of the sampling, including site photographs, a figure showing all sampling locations, and tabulated analytical results. The memorandum will be sent to EPA and ADEC within 60 days of the receipt of final results from the analytical laboratory.

5. References

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