

# RECOMMENDATIONS TO MEET STATE AND FEDERAL REQUIREMENTS FOR PROTECTING OCEAN WATERS



Photo: Nye Beach, Newport

## **NPDES Wastewater Permit #101409 Georgia Pacific Pulp Mill: Toledo, OR**



Submitted by: Surfrider Foundation, Newport Chapter  
March, 2008

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## Report Contributors

Kristen Milligan

Pete Stauffer

Liz Crosson

Charlie Plybon

Melinda McComb

JD Brown (CRAG)

Mark Riskedahl (NEDC)

\*This Report was unanimously approved by the Executive Council of the Newport Chapter of the Surfrider Foundation

## Executive Summary

This report provides recommendations for improving the scientific monitoring and assessment of the National Pollutant Discharge Elimination System (NPDES) wastewater permit of the Georgia Pacific Pulp and Paper Mill in Toledo. The primary outfall for the mill is located 3,800 feet from shore in the vicinity of important recreational areas, popular fishing grounds, and historic Nye Beach. Some of the report's recommendations focus on integrating existing (and readily available) data sets (i.e., turbidity, hypoxia, etc.) into analyses of the NPDES permit. Other recommendations focus on additional monitoring needs such as biological tissue sampling, sediment studies, and field measurements of effluent mixing. Providing for an NPDES permit that is based on the best science and consistent with state and federal law is in the best interests of public health, sustainable fisheries, and tourism-related economies.



Newport, April 23<sup>rd</sup>, 2006

## Introduction

The Surfrider Foundation is a non-profit environmental organization dedicated to the protection and enjoyment of the world's oceans, waves and beaches for all people, through conservation, activism, research and education. Our Newport Chapter is comprised of local residents who enjoy surfing, diving, fishing, and spending time at the beach. For reasons related to both public health and ecosystem protection, the chapter is extremely interested in water quality issues in the Nye Beach area.

Surfrider's clean water initiative is focused on protecting water quality in coastal watersheds and in the nearshore marine environment. To this end, the Newport Chapter advocates for strong water quality regulations, adequate monitoring of marine recreational waters, reporting and posting of water quality results,

reduction of polluted discharges into the ocean, and education on personal responsibility for the reduction of water pollution. We also support smart land use planning to ensure that coastal environmental resources are protected and healthy watersheds are maintained, as we have demonstrated with our work with the City of Newport stormwater planning.

In September 2006, Surfrider Foundation and four other organizations formally petitioned the Oregon Department of Environmental Quality (DEQ) to reconsider the terms of the NPDES wastewater permit of the Georgia Pacific Pulp and Paper in Toledo, Oregon. The Petition provided legal and scientific arguments for strengthening the terms of the mill's wastewater permit. DEQ formally accepted the Petition on October 18th, 2006 and has been working to complete the reconsideration since then.

On January 22, 2008, members of Surfrider's Environmental Issues Team met with DEQ staff to discuss the ongoing reconsideration process. During the course of the meeting, it became clear that additional science-based resources could be extremely helpful in assisting agency staff in their efforts. This document is intended to provide support for DEQ to improve the monitoring and assessment of the Georgia Pacific wastewater permit, and bring the agency closer to compliance with state and federal laws that protect water quality.

## 1. Use Data from Coastal Ocean Water Quality Monitoring Programs

Except for BEACH Act monitoring<sup>1</sup> of bacteria at recreational beaches and monitoring for harmful algal blooms, Oregon has no established program to monitor marine waters. This is a major problem for the state when determining NPDES compliance with the Clean Water Act's Ocean Discharge Criteria and tracking trends in the coastal ocean.

To issue a § 402 permit for an ocean discharge, the Clean Water Act's Ocean Discharge Criteria guidelines require the agency to first "determine whether a discharge will cause unreasonable degradation of the marine environment" based on several factors. 40 C.F.R. §125.122. Factors that must be considered include the potential for bioaccumulation, the composition and vulnerability of exposed biological communities, the importance and characteristics of the receiving waterbody, and other factors that may be appropriate. *Id.* Moreover, the Clean Water Act states that "no permit shall be issued" where there is insufficient information to make a reasonable judgment on any of these guidelines. 33 U.S.C. §1343. Under the rare circumstances where a discharge with insufficient information may be permitted, comprehensive monitoring is required. 40 C.F.R. §125.123.

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<sup>1</sup> The Oregon Coastal Beach Monitoring Program is a joint project between DEQ and the Oregon Department of Human Services (DHS).

Effectively, the state relies on research institutions to perform surveys of ocean conditions yet makes no visible attempt to gather this information for management purposes. For example, monitoring for Dissolved Oxygen levels is performed by a collaborative research network.<sup>2</sup> To our knowledge, these dissolved oxygen results were not incorporated into permit water quality evaluations by DEQ and the permittee when assessing the Georgia Pacific Pulp mill discharge permit.

Parameters that can be documented by collecting data, which are likely available from research institutions are: turbidity, chlorophyll-a, dissolved oxygen, nutrients, temperature, salinity, and pH. Based on our review of documents pertaining to the Georgia Pacific pulp mill ocean discharge, we conclude that these resources have not been investigated and used (where available and applicable) by the permittee or the state to adequately assess compliance with state and federal water quality requirements.

It is our opinion that there is an opportunity for the DEQ to form partnerships with research programs to gather the necessary information for meeting state and federal regulatory and legal water quality standards<sup>3</sup>. These resources should be galvanized to the maximum extent possible and used by the state to provide basic information about water quality in state waters.

Given:

- (i) the state's inadequate monitoring program for informing NPDES permitting in marine waters,
- (ii) the number of permits that will expire in the next two years, and
- (iii) the goals stated in the West Coast Governor's Agreement for Ocean Health,

we urge DEQ to take all possible measures to assess the state of coastal ocean water quality information and gather the necessary information to ensure that water quality is fully protected. We recommend that DEQ contact individuals and organizations to determine available data and extent to which those data can be applied to water quality compliance.

One mechanism for collecting available data would be to convene a meeting to focus on Oregon's coastal water quality program and filling-in of information gaps. Attendees of such a meeting could include researchers with a long history of water quality monitoring in Oregon's coastal ocean. This collection of

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<sup>2</sup> More information about the collaborative network can be found at these research organization websites: PISCO [www.piscoweb.org/outreach/hypoxia](http://www.piscoweb.org/outreach/hypoxia) and OrCOOS [http://agate.coas.oregonstate.edu/hypo\\_research\\_opps.html](http://agate.coas.oregonstate.edu/hypo_research_opps.html)

<sup>3</sup> For example, the Ocean Observing Systems such as OrCOOS and NANOOS are working to bring together ocean observations to help address issues related to a number of management foci, including ecosystem preservation and management; see [http://agate.coas.oregonstate.edu/hypo\\_research\\_opps.html](http://agate.coas.oregonstate.edu/hypo_research_opps.html), <http://www.nanoos.org/> for more information. There are other groups also working in Oregon's state waters, including along the Newport Hydrographic (NH) transect line

information will help to inform water quality decisions along the entire coastline and cultivate partnerships to leverage and seek resources for future monitoring that can best inform management.

#### Recommendation 1.1

DEQ should incorporate relevant water quality data sets from existing programs into NPDES modeling and assessment to determine compliance with Ocean Discharge Criteria.

#### Recommendation 1.2

In close consultation with constituents, other management programs, and technical experts, DEQ should identify (i) water quality monitoring needs for the coastal ocean and (ii) a strategy for addressing those needs.

## 2. Meet State Requirements for Turbidity

Oregon requires that the turbidity of the permitted discharge not exceed the background of the receiving waterbody by more than ten percent. OAR 340-041-003. Further, the federal Clean Water Act Ocean Discharge Criteria guidelines' standard of "unreasonable degradation of the marine environment" requires consideration of established water quality criteria including turbidity criterion in the determination. 40 C.F.R. §125.122(a)(10).

We are encouraged that the state has required the permittee to monitor for turbidity in the effluent. However, in our meeting with DEQ on January 22, it was clear that the state does not currently have data to determine the background level of turbidity for the receiving water body. Therefore, the state has no means by which to compare the effluent turbidity with the background turbidity to determine compliance with the state water quality criterion.

We recognize the challenge of compiling historical data for this region, especially given this outfall's close proximity to the shore and different methods for measuring turbidity. Some historical data exists for turbidity in this coastal area<sup>4</sup>. DEQ must require that the permittee support ongoing monitoring of turbidity in the receiving environment to ensure compliance with state and federal standards.

#### Recommendation 2.1

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<sup>4</sup> For example, the Oregon State University National Oceanographic Partnership Program (OSU-NOPP) performed a study in 1999 around the Newport Hydrographic line and included sampling of shallow areas, into approximately 8 m depth. Transmission data were collected with a transmissometer (WetLabs C-Star). The study's report is a technical paper and not available online. Reference: Austin, J.A., J.A. Barth, S.D. Pierce. 2000. *Small-boat hydrographic surveys of the Oregon mid- to inner shelf*. Data Report 178, College of Oceanic and Atmospheric Sciences Reference 00-2, Oregon State University. Contact Dr. Milligan ([milligan.kristen@yahoo.com](mailto:milligan.kristen@yahoo.com)) for more information.

DEQ should compare effluent turbidity data with baseline levels in receiving waters to assess compliance with the state's water quality criterion.

### Recommendation 2.2

The state should require the permittee to support on-going turbidity measurements at appropriate reference sites in the discharge area, as well as control sites outside the area of influence of the discharge. Limits should be placed, so that any variation above the limit results in a violation.

## 3. Meet Narrative Standards for Dissolved Oxygen

The mixing zone report and the permit water quality evaluations did not take into account low oxygen conditions along the Oregon coast. We consider this a massive oversight. DEQ must ensure that the effluent does not (a) increase the potential for localized exacerbation of low oxygen conditions and (b) have other impacts (cumulative) to the stressed benthic environment.

Oregon's water quality criterion for Dissolved Oxygen states that "for ocean waters, no measurable reduction in dissolved oxygen concentration may be allowed." OAR 340-041-0016. Because the Battelle Mixing Zone Study assumes ambient ocean oxygen levels of 8.48 mg/l to dilute GP's effluent, GP's permit currently fails to consider local hypoxic conditions as an element to understanding actual DO levels at the point of discharge. Accordingly, expert opinion should be consulted, and evaluations should include analysis of possible discharge alternatives during hypoxic conditions.

Since 2002, hypoxic (low oxygen) waters have appeared during the summer along the coast of Oregon<sup>5, 6</sup>. Shifting wind patterns and changing ocean conditions play important roles in these hypoxic events. It is likely that hypoxia in this coastal region will continue on a regular basis as part of normal ocean conditions<sup>7</sup>. Researchers have been quoted as saying that hypoxia is the "new normal" during summertime in Oregon. We believe that wastewater discharge permits must carefully evaluate the potential for local exacerbation because of effluent low dissolved oxygen level, high biological and chemical oxygen demand, and elevated nutrients.

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<sup>5</sup> A recent article was published on hypoxia in the journal *Science*: F. Chan, F., J. A. Barth, J. Lubchenco, A. Kirincich, H. Weeks, W. T. Peterson, B. A. Menge. 2008. Emergence of Anoxia in the California Current Large Marine Ecosystem. *Science*. 319: 920. <http://dx.doi/10.1126/science.1149016>

<sup>6</sup> Prior to permit renewal, there was also another publication in the peer-reviewed literature documenting hypoxia. Grantham *et al.* 2004. Upwelling-driven nearshore hypoxia signals ecosystem and oceanographic changes in the northeast Pacific. *Nature* 429:749-754.

<sup>7</sup> See <http://oregonstate.edu/dept/ncs/newsearch/2008/Feb08/aaasdeadzone.html>

As noted in section 1, there is a collaborative network of groups monitoring and researching the nearshore Oregon coastal ocean, including for hypoxia. The primary research groups focusing on this oceanographic event are PISCO and OrCOOS.<sup>8</sup> Oregon Department of Fish and Wildlife's Marine Habitat Project (ODFW) is also a major partner in hypoxia monitoring, providing visual surveys of organisms using a Remotely Operated Vehicle (ROV) in areas affected by nearshore hypoxia. Michael Donnellan leads this ODFW Habitat Project.

### Recommendation 3.1

DEQ should conduct analyses for dissolved oxygen that provide for the full range of naturally occurring oxygen levels, including levels typical of season coastal hypoxia events. A modified permit should include appropriate limits on effluent Dissolved Oxygen and Biological Oxygen Demand (BOD) to ensure water quality, including during hypoxic conditions. DEQ analyses must be conducted in consultation with hypoxia technical experts.



Photo: Fisherman at South Jetty: Feb 27, 2008

## 4. Determine Compliance with Ocean Discharge Criteria

The 2004 studies performed by Battelle on behalf of Georgia Pacific to determine impacts to the ecosystem are completely inadequate. Ecosystem impacts can range from recreational, aesthetic, chemical, physical, and biological. In the discussion of the environmental mapping to determine impacts, Battelle states:

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<sup>8</sup> More information about the collaborative network can be found at these research organization websites: PISCO [www.piscoweb.org/outreach/hypoxia](http://www.piscoweb.org/outreach/hypoxia) and OrCOOS [http://agate.coas.oregonstate.edu/hypoxia\\_research\\_ops.html](http://agate.coas.oregonstate.edu/hypoxia_research_ops.html)



"The publicly available environmental data for the Newport region (particularly GIS data) exist at a scale that allows for a general description of the physical and biological attributes of the area. However, site-specific data or data presented at a finer scale were not readily available for this study, due in part to the lack of detailed studies in the region, specifically in the area of the mixing and outfall zones....Most of the data that is available is not recent .... This should be kept in mind when assessing the impact of the outfall mixing zone on the local habitats and resources. Overall, although it appears that resources are not impacted in the immediate vicinity of the outfall mixing zone, the results are somewhat problematic due to the lack of recently available supporting data." [emphasis added, page 5-17 of "Mixing Zone Study - GP Toledo, NPDES Permit No. 101409" March 2005 report by Battelle. Lead authors are Tarang Khangaonkar, Sreenivasa Chopakatta, Zhaoqing Yang.]

Given this conclusion, it is unclear why DEQ has not required studies of the area immediately surrounding the outfall with appropriate reference sites. There is clearly insufficient information to conclude whether or not the discharge complies with state and federal water quality standards and objectives (e.g., Biocriteria and Clean Water Act Ocean Discharge Criteria; see Petition for Reconsideration).

We summarize major ecosystem considerations below.

#### 4.1 Recreational 'Beneficial Uses'

Mixing zones may not cause or significantly contribute to exceedances of water quality standards and the zone must be defined to "not threaten public health" and to "minimize adverse effects on other designated beneficial uses." OAR 340-041-0053(2)(b); (c). However, the Battelle report fails to address in its environmental mapping and assessment the many recreational ocean uses in the vicinity of Nye Beach. This raises questions as to whether risks are being minimized for local surfers, divers, fishermen, swimmers, etc. Surfrider Foundation will be happy to assist in providing relevant information so this may be appropriately addressed in an updated study report.

##### Recommendation 4.1

Detailed assessment of marine recreational uses in the area and the extent to which these uses are impacted by degraded water quality should be required as part of the Mixing Zone Report.

#### 4.2 Mixing Zone Analysis

The new mixing zone for the outfall off Nye Beach was determined based on a single dye study and simple models which were used to predict plume behavior and obtain dilution estimates. This new zone was determined by DEQ and Georgia Pacific (via Battelle consulting group) and used for all water quality

evaluations for the 2006 permit. The nearshore environment off Nye Beach is a highly dynamic and complex system. Tidal reversals, variable winds, and fluctuating longshore and rip currents, are just some of the factors that need to be considered.

Because no studies have been conducted or models run that consider the full range of these physical ocean conditions found in the coastal waters off Nye Beach, more analysis is clearly needed. This includes both additional dye studies, as well as in situ measurements of relevant parameters to ensure that the new mixing zone area is indeed correct.

There is evidence pointing to the effluent plume moving differently than the dye study and models would indicate. As reviewed in the Petition for Reconsideration, frequent beach and nearshore users in the Newport area have described an intermittent “black and magenta plume” in the surf zone. These public comments are supported by a June 2005 aerial photo taken by Oregon Department of Transportation (ODOT) showing the “black plume” entering the surf zone in front of Newport’s tourist hotels. The source of the plume is consistent with the GPS coordinates of the GP 001 outfall given in the Batelle Mixing Zone Study (p 2.9). This plume is also visible at Google Earth.

Plume movement should be assessed over a temporal scale that encompasses the full range of ocean conditions exhibited in the coastal waters off Nye Beach including: high stratification, different intensities of upwelling, and strong onshore winds. Surfrider’s Environmental Issues Team is willing to help develop and review an updated study design for this purpose. We expect that DEQ will find that the plume extends into recreational waters and does not perform as modeled; repercussions include a change in outfall location or diffuser arrays or investment to implement treatment alternatives (such as, increase amount of water recycling within the plant and decrease volumes of discharge).

Surfrider understands that current state regulations allow DEQ to suspend all or part of water quality standards in designated portions of receiving waters to serve as a zone of dilution for wastes. Our strong preference would be for the state of Oregon to instead require that ambient water quality standards are met at the end of pipe. However, in the absence of such an interpretation, the agency must provide a higher standard of science and assessment to ensure that state legal requirements for mixing zones (OAR 340-041-0053(2) are met with respect to the Georgia Pacific Toledo mill.

#### Recommendation 4.2

Additional mixing zone analyses should be conducted for the Nye Beach outfall that account for the full range of physical ocean conditions that occur in the area, verify plume dynamics and areas most likely impacted, and incorporate in situ measurements.

#### 4.3 Chemical Pollution

### Recommendation 4.3

A monitoring plan should be required that quantifies potentials for pollutant bioaccumulation, persistence, transport, and impacts. Specific elements are highlighted in the section below.

#### Need for Enhanced Monitoring

Sediments accumulate pollutants, therefore integrating pollutants over time and showing persistence of specific pollutants in the system. Contaminated sediments contain chemicals at concentrations that pose known or suspected threat to aquatic life, wildlife or human health. Contaminants found in sediments include bioaccumulative contaminants that bind differentially to lipids and fats, and thus transfer efficiently through the food chain. Other types of toxins include those such as heavy metals or many Polycyclic Aromatic Hydrocarbons (PAHs) that may pose less biomagnification risks but can also significantly and negatively affect organisms (mutations, liver disease, reduced fitness, reduced reproductive abilities, tissue degradation). Contaminated sediments have been documented around ocean outfalls. In the particular case of this facility, our understanding is that water quality assessments for contaminated sediments have not been performed around the outfall of the GP Toledo mill. We also understand that pollutant discharges are reported from this outfall (as part of EPA's Toxic Release Inventory).<sup>9</sup>

In evaluations for the GP Toledo Mill discharge, there are no assessments for (i) pollutant loading in sediments, (ii) potential effects to aquatic species, or (iii) potential for contaminants to be transferred from sediments through the food chain. Generally, unbleached pulp mill effluents contain resin acids and soaps, fatty acids, diterpene alcohols, and phytosterols. Smaller gonads, delayed sexual maturity and depression of sex steroids have been reported in fish exposed to pulp and paper mill effluents. Bioaccumulatives are also found in wastewaters. Furthermore, landfill leachate (from mill and Marion County) has been part of the historical loadings in the mill discharge.

Measurement and evaluation of pollutants in sediments provide an excellent method by which to measure levels of pollutants persisting and accumulating in the affected area around the outfall, that otherwise are undetected in the effluent during a one-time chemical scan. For example, many hydrophobic chemicals are often undetectable or detectable with low concentrations in water but will accumulate in sediments.

There is clearly insufficient information about impacts to the receiving environment from this wastewater discharge. In particular and as discussed at the January 22<sup>nd</sup> meeting, there is insufficient information on contaminants that can not be detected in effluent due to technical insensitivity (i.e., Recommended

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<sup>9</sup> For example, 2004 and 2005 toxic release inventories reported high annual emissions from this outfall for catechols, nitrates, acetaldehyde, benzo(g,h)perylene, glycol ethers, heavy metals.

Quantitation Levels)<sup>10</sup>. Furthermore, there is no information on accumulation in the benthic environment and associated food chains, total nutrient discharges, and potential impacts from those discharges of elevated pathogen concentrations.

### Legal Requirements

The Federal Clean Water Act prohibits Georgia Pacific from causing unreasonable degradation of the marine environment. See *supra* pp. 3-4; 33 U.S.C. §1343; 40 CFR §125.122. This determination must be based on several criteria including, but not limited to, (1) quantities, composition and potential for bioaccumulation or persistence of the pollutants to the discharged; (2) the potential transport of such pollutants by biological, physical or chemical processes; and (3) the potential impacts on human health through direct and indirect pathways. *Id.* Because DEQ does not currently have sufficient information to make this determination, further monitoring and studies are required.

Further, the Clean Water Act requires, as a permit condition, that NPDES permits include monitoring and reporting. 40 C.F.R. §122.41(j). Specifically, “samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.” *Id.* The nature of this “monitored activity” requires that DEQ conduct or require monitoring of (1) benthic species and sediment constituents to comply with mixing zone criteria (objectionable deposits prohibited) pursuant to OAR 340-041-0053 and biocriteria requirements pursuant to OAR 340-041-0011; (2) receiving waters to determine whether WQS are met for several parameters including turbidity and dissolved oxygen; and (3) mixing zone threats to public health pursuant to OAR 340-041-0053(2)(c)(D), which includes an assessment of existing uses of the discharge area.

### Monitoring Recommendations

To meet these requirements, we recommend that DEQ monitor and evaluate sediments and infaunal tissue in the area of the discharge and representative reference sites (likely to be unimpacted). Benthic faunal and infaunal species compositions should also be measured to determine impacts.

Sediments and animals integrate contamination over time. Monitoring of sediment chemistry, sediment toxicity, and animal body burdens would provide Oregon with a clear and comprehensive picture of accumulation in this area of the coastal system from the pulp mill.

We note that species assessments are not sufficient as stand-alone measures of effects to ecological communities to comply with Clean Water Act Ocean Discharge Criteria regulations. Benthic surveys to assess contamination typically use a variety of approaches, including indices concurrent with sediment toxicity

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<sup>10</sup> We again note that currently accepted detection limit concentrations for a number of priority pollutants exceed water quality standards.

and chemical analyses. This is especially the case for determining chemical bioaccumulation and trophic transfer, where benthic indices alone cannot indicate trophic transfer of bioaccumulative toxins. The area surrounding the discharge also serves as a valuable source of food for fish populations. This further underscores the need and importance of direct analyses to assess potential for toxin transfer through the food chain from this discharge.

Frameworks, methods, and regulatory tools are available. Suites of these tools are used in Clean Water Act Ocean Discharge Criteria evaluations (e.g., Southern California Coastal Water Research Project (SCCWRP)). For example:

- Sediment toxicity tests are available from and are used regularly by EPA and NOAA. The utility of toxicity tests is that they offer direct and quantifiable evidence of effects from sediment contamination. This is in contrast to macrofaunal community analyses that are insufficient for detecting and concluding effects from pollution. Examples of available and standardized procedures are:
  - Sublethal effects and quick-screening using Microtox bacterial luminescence
  - Chronic toxicity testing with bivalve larvae
  - Chronic toxicity testing with amphipod *Leptocheirus plumulosus* (EPA/600/R-01/020, March 2001)
  - Acute toxicity testing with amphipods (EPA/600/R-94/025, 1994)
- Bulk sediment chemistry: Sediments should be assessed within zones of impact and at appropriate reference sites. Parameters to be measured include (a) chemicals for which there are sediment quality guidelines (see NOAA's sediment quality guidelines that are used in National Status and Trends and sediment quality triad) and (b) bioaccumulative toxins.
- Bioaccumulation: Sessile benthic infauna should be assessed for tissue contamination and compared to appropriate reference areas. There are EPA-approved guidelines for measuring bioaccumulation in tissues.

#### 4.4 Temperature

OAR 340-041-0028(7) states that "ocean and bay waters may not be warmed by more than 0.3 degrees Celsius (0.5 degrees Fahrenheit) above the ambient condition unless a greater increase would not reasonably be expected to adversely affect fish or other aquatic life." The maximum temperature differential between the effluent and ambient seawater at outfall 001 from 1998 to 2004 was 19.8 degrees Celsius (Battelle Mixing Zone Study). The impacts of this warm water must be determined. Impacts may include avoidance of this area by wildlife at specific times. The dilution calculations performed by DEQ cannot adequately predict temperature in the mixing zone without in situ

measurements. There is currently no temperature limitation in the NPDES permit.

Recommendation 4.4:

Mixing zone and monitoring of the receiving environment must include careful analysis of temperature to ensure compliance with narrative criteria and protect ecosystem function in this area.

## 5. Meet Bacterial Standards

We thank DEQ for sending the requested report on bacteria sources and discharge levels in the Georgia Pacific pulp mill effluent. The results are concerning for two reasons: (1) concentrations of pathogens are extremely high and (2) the permittee proposes to use hypochlorite as the disinfection method to mitigate this problem. Our understanding is that field trials will be performed to determine if hypochlorite disinfection is a reasonable method. In the meantime, elevated levels of bacteria will likely continue to be discharged to the ocean off Nye Beach and/or new chemical constituents will be added to the waste stream.

Oregon's Bacteria Numeric Criterion for Marine Waters requires a limit for fecal coliform of a median concentration of 14 organisms per 100 milliliters. OAR 340-041-0009. However, the three bacteria samples submitted for Georgia Pacific's Bacteria Monitoring Plan (November 28, 2006) equaled 130, 1,400, and 1,300 counts of fecal coliform per 100 milliliters in the ocean-bound effluent. The fecal indicator *Enterococcus* likewise grossly exceeded all applicable standards for recreational health. Absence of restriction on a bacteria discharge known to present a problem results in a violation of the numeric criterion. OAR 340-041-0009(1)(b).

Additionally, although Oregon mixing zone regulations allow dischargers to suspend water quality standards in a defined mixing zone at the point of discharge provided that certain conditions are met, DEQ must define a mixing zone around a wastewater discharge to "not threaten public health." OAR 340-041-0053(2)(c)(D). DEQ's guidance document on mixing zones describes the public health requirement as "understood to mean that no mixing zone is allowed for bacteria. Bacteria criteria must be met at the end of the pipe."<sup>11</sup> It further states that this interpretation is consistent with EPA's Handbook on Water Quality Standards:

The discussion on human health risks applies to long and

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<sup>11</sup> The guidance document was submitted for Steve Schnurbusch's, DEQ permit writer, Masters Degree in Environmental Management at Portland State University, entitled "A Mixing Zone Guidance Document Prepared for the Oregon Department of Environmental Quality." 2000. This was the operative agency guidance document on mixing zones at the time of Georgia Pacific's permit renewal. In fact, EPA's website contains a "Compilation of EPA Mixing Zone Documents" which includes this document as Oregon's Guidance on mixing zones. See <http://www.epa.gov/waterscience/standards/mixingzone> (last visited February 10, 2008).

short-term health risks. The Handbook states that mixing zones must be sized and located such that they do not create significant health risks when considering likely pathways of exposure. Likely pathways of exposure include direct human intake as could occur when swimming, or indirect human intake such as through drinking water or fish tissue consumption. To reduce the short term health risks of waterborne diseases originating from fecal sources, the Department requires bacteria criteria to be met at the end of the pipe.

Because Nye Beach is an important recreational and tourist destination, public health concerns and Oregon's water quality criteria for bacteria require immediate compliance.

We are also seriously concerned about the use of hypochlorite, which will constitute a new pollutant to the already poorly characterized waste stream. Hypochlorite is often used for disinfecting wastewaters in order to prevent the spread of pathogenic microorganisms. We are concerned about impacts from the discharge of disinfectants and their possible by-products, such as halogenated organic compounds that can be highly toxic and accumulate in the sediments and food chains. Surfrider looks forward to discussing these substantial concerns with DEQ.

#### Recommendation 5.1

DEQ should immediately require frequent monitoring of bacterial indicators in the effluent (monthly or twice per month). Limits should be placed, without a mixing zone allowance. Any chemical additions to the waste stream must receive adequate public and technical review and comment.

## 6. Antidegradation Reviews

As articulated at the January 22nd meeting with DEQ, our interpretations of the antidegradation regulations differ with the agency on two issues. Before an antidegradation review is required, the agency must determine whether the permitted discharge will exceed the previously allowed discharge. If the answer is yes, the agency is required to conduct an antidegradation review. There are two remaining contexts where the renewed GP permit seems to allow further degradation not previously allowed: (1) the ocean outfall, 001, includes revised mixing zone boundaries which expand the zone into an area not previously covered (although the actual size of the mixing zone is not increased); and (2) the Yaquina River outfall, 003, has a new ZID where acute toxic effluent was not previously allowed.

First, the alteration of the mixing zone at 001 results in a mixing zone in a new portion of the Pacific Ocean. This is relevant because Oregon rules do not

consider new discharges into existing mixing zones to constitute degradation. However, an existing mixing zone is described as "the portion of a waterbody that has been included in a previous mixing zone for a permitted source." OAR 340-041-0004(3)(a). Because the new mixing zone, along the vertical lines of the rectangle, covers a new portion of the waterbody, the agency was required to conduct an antidegradation review.

Second, DEQ claims that the ZID at outfall 003 was previously an "implied ZID," so was a previously existing mixing zone. DEQ also stated at the January 22nd meeting that the new ZID was created to "clarify what was not there in the past." Because the establishment of a new ZID, that never existed before, is necessarily a discharge that exceeds the previously allowed discharge, an antidegradation review is required.

#### Recommendation 6.1

DEQ should conduct an antidegradation review of the two new mixing zones at outfall 001 and 003. Review is required to "... protect, maintain, and enhance existing surface water quality to ensure the full protection of all existing beneficial uses." 340-041-0004(1).