The Proposed Nestlé Bottled Water Facility In Cascade Locks:

A Preliminary Analysis of the Economic Issues

Prepared for Food & Water Watch

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Executive Summary

Nestlé Corporation has proposed building a bottled water facility in Cascade Locks, Oregon in the heart of the Columbia Gorge National Scenic Area. Despite its potential to create jobs and contribute to the tax base, Nestlé's proposal is not a straightforward win-win opportunity for Nestlé, the city of Cascade Locks, and the state. To move forward, this facility will require investments from both the city and the state. Our purpose in this report to Food and Water Watch is to identify the potential costs to Oregonians associated with this proposal that warrant further examination.

As the proposal currently stands, Nestlé would invest $50 million to construct a 250,000 square foot state-of-the-art two-line production facility that would bottle spring water from nearby Oxbow Springs and municipal water from the city of Cascade Locks. Bottled water would then be shipped by truck to Portland for market distribution. Nestlé projects that the new facility would support a total of 53 jobs.

Nestlé wants to buy the spring water directly from Cascade Locks to bottle under its Arrowhead brand. The water right to Oxbow Springs, however, is held by ODFW. For this arrangement to work, the state would have to approve a water rights exchange, whereby ODFW would provide a portion of Oxbow Springs water to the city so that the city could sell the spring water to Nestlé as a municipal water customer. This agreement signifies a de-facto partnership between Nestlé and a state agency To compensate for the water taken away from the hatchery, the city would redirect well water to the hatchery. Nestlé has stated its willingness to pay for the infrastructure to route the city's well water to the hatchery to replace the spring water.

In addition to the well water that will have to be supplied to the hatchery, Nestlé plans to bottle well water to sell under its Pure Life brand. One question that needs to be addressed is how this rate of extraction will impact groundwater levels and the production capacity of the two existing wells in Cascade Locks, especially over the long-term given climate change and population growth. A change in fresh water availability will impact the region's development potential, possibly foreclosing opportunities for growth in other industries.

The facility would also increase demands on other public infrastructure. The facility will generate wastewater that will have to be treated. Its electricity demands may exceed the current capacity of the city's substation and transformers, requiring investments in new upgrades. Roads and highways will have to be upgraded and maintained to accommodate the increased truck traffic to and from the facility. Nestlé has stated in public meetings that it will not pay for the necessary road upgrades; nor has it agreed to pay the potential costs of upgrading other public facilities.

The location of a Nestle bottled water plant in the midst of a National Scenic Area has to be carefully analyzed for its impacts on tourism and the loss of recreational and aesthetic value. The increase in noise pollution, air pollution, traffic, and greater risks of accidents from increased truck traffic pose potential costs for Oregonians living and recreating in the area.

Bottled water is a resource-intensive product that generates tremendous plastics waste. It also has a large carbon footprint because of the fossil fuels indicated in the production of plastic water bottles and the transport of bottled water to market. The bottling of local water supplies for sale in other markets has been linked to water shortages in many localities around the globe. Bottled water, however, is not necessarily cleaner or healthier to drink the tap water. For these reasons, bottled water is the target of

consumer safety, human rights, and environmental campaigns aimed at reducing consumer demand for bottled water. These campaigns are gaining momentum across the country, calling into the question the future growth of this industry. Multnomah County, for example, has passed resolutions banning the use of taxpayer money to purchase bottled water.

Nestlé's proposed facility in the heart of the Columbia Gorge can create relatively few jobs by selling one of region's greatest assets – our fresh water. The proposal implies potential costs to taxpayers that deserve further examination before a decision is made to enable Nestlé to move forward. The decision to bring a Nestlé bottled water plant to Cascade Locks represents an investment on the part of both the city and the state. Investing in alternative development opportunities for the region that can create local employment, contribute to the tax base, and more sustainably draw on the region's natural competitive advantages and amenities may better serve the interests of Oregonians over the long term.

1. Introduction

Nestlé Corporation, the world's largest food and beverage company, has proposed building a bottled water facility in Cascade Locks, Oregon in the heart of the Columbia Gorge National Scenic Area. The Nestlé facility, if approved, would bottle both municipal water from the city of Cascade Locks and spring water from the region, under its Pure Life and Arrowhead brands respectively. The area receives copious rainfall, contains many natural springs, and borders the fresh water of the Columbia River. It is also conveniently located along Interstate 84, is directly serviced by the Union Pacific Railroad, and is less than 45 miles from Portland, Oregon and its air, freight, and port facilities. It is this abundance of fresh water so near to a metropolitan center that attracts Nestlé Corporation to Cascade Locks. In return, the proposed fifty-million dollar state-of-the-art facility can bring new jobs and much needed tax revenue to this region[1].

Though fresh water may seem plentiful in the Gorge, there are potential costs to Oregonians from Nestlé's proposed facility that deserve further exploration. The spring water Nestlé intends to bottle for its Arrowhead brand currently supplies a hatchery maintained by the Oregon Fish and Wildlife Department (ODFW). Under the current proposal, the state will receive no compensation from Nestlé for the diversion of water from the hatchery; however Nestlé has promised to pay for the infrastructure to route the city's well water to the hatchery to replace the spring water.[2] This requires the city of Cascade Locks to enter into an agreement with ODFW to receive water rights from Oxbow Springs.[3] This agreement signifies a de-facto partnership between Nestlé and a state agency.

In addition to the well water that will have to be supplied to the hatchery, Nestlé plans to bottle well water to sell under its Pure Life brand. One question that needs to be addressed is how this rate of extraction will impact groundwater levels and the production capacity of the city's two existing wells, especially over the long-term. A change in fresh water availability will impact the region's development potential, possibly foreclosing opportunities for growth in other industries.

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[1] Information about the proposed Nestlé project retrieved from the Nestlé Waters North America website 8/1/2011: http://www.Nestléwaterspnw.com/projectOverview.aspx.

[2] Ibid.

[3] Ibid.

The facility will also generate wastewater that will have to be treated. Its electricity demands may exceed the current capacity of the city's substation and transformers, requiring investments in new upgrades. Roads and highways will have to be upgraded and maintained to accommodate the increased truck traffic to and from the facility. Nestlé has already stated in public meetings that it will not pay for the necessary road upgrades. The increase in noise pollution, air pollution, traffic, and increased risks of accidents pose potential real costs for Oregonians living and recreating in the area. The location of an industrial facility in a National Scenic Area has to be carefully analyzed for its impacts on tourism and the loss of recreational and aesthetic value. Lastly, the carbon emissions associated with bottled water produced and shipped from the facility in Cascade Locks need to be examined, especially in light of Oregon's ambitious goals for carbon emissions reduction.

Our purpose in this report to Food and Water Watch is to identify the potential costs to Oregonians associated with the proposed bottled water facility in Cascade Locks. As the proposal has yet to be finalized, many of the exact details of the proposal are still unknown and subject to change. Neither an environmental impact assessment nor a full hydrological study of the project has been completed to our knowledge. It is our professional opinion that there are potential costs to Oregonians associated with this project that could be substantial and warrant further evaluation. We also question the appropriateness of building a bottled water facility in Oregon, given mounting concerns over the environmental impacts of bottled water and the resulting public backlash. Bottled water is a resource intensive industry that generates tremendous plastics waste. There are likely alternative development opportunities for Cascade Locks and Oregon that can create local employment, contribute to the tax base, and more sustainably draw on the region's natural competitive advantages and amenities.

2. Background

2.1 Water Scarcity and Climate Change

Fresh water is the sustaining source of all life on the planet. There is growing consensus by experts, however, that the world is rapidly heading towards a physical shortage of fresh water. Fresh water shortages are likely to become a source of strategic rivalry, regionally, nationally, and even globally. Twenty-five percent of the world's population already lives under water stress (less than 1700 m3/person/year). By 2010, there were 1.2 billion people worldwide who lacked access to safe drinking water. It is estimated that by 2025, between 2.7 and 3.5 billion people globally – more than half of the world's population - will not have sufficient access to fresh water (WHO 2000; IISD 2006). The social, economic, and ecological implications of fresh water shortages may prove staggering.

The concept of water scarcity is widely debated and is relatively complex because it is a crisis of both water supply and demand. Population growth and climate change are expected to exacerbate water scarcity over the next decades. There is now broad agreement that global warming will have major impacts on global water resources. Higher temperature will accelerate the hydrologic cycle, altering precipitation, the magnitude and timing of runoff, and the intensity of floods and droughts. Warmer temperatures will also increase evapotranspiration rates and alter soil moisture and infiltration rates. Sea level rise and increased storm surges could adversely impact water supplies in some coastal areas. Climate change may contribute to population shifts which could increase demand for fresh water in regions already struggling with fresh water scarcity. For these reasons, the potential impacts of climate change and population growth on water supplies are increasingly factored into water planning and project evaluation (IPCC 2007).

2.2. Bottled Water

Increased demand for fresh water for domestic consumption is one of several reasons that global water demand continues to outpace population growth. This includes the growth in demand for bottled water. Bottled water consumption has increased dramatically during the last decades. Annual per capita consumption of bottled water in the U.S. grew from 16.2 gallons in 1999 to a high of 29.0 gallons in 2007 (table 1). Bottled water volume in the U.S. increased by almost 70% from 2001 to 2007, while producers' revenues almost doubled from $6.8 million to $11.6 million (table 2). Though per capita consumption in the U.S. has declined slightly in recent years, the U.S. remains the number one consumer of bottled water in the world, followed by Mexico and China (GAO 2009). It is estimated that more than $100 billion is spent annually each year on bottled water. Bottled water is now the third largest beverage industry behind beer and soda, having surpassed milk, coffee, and juice in the number of gallons sold (Columbia Water Center 2011). Bottled water now commands a 30% market share of the liquid refreshment beverages marketplace.[4]

Table 1. U.S. Bottled Water Market: Per Capita Consumption

U.S. Bottled Water Market: Per Capita Consumption		
Year	Gallons Per Capita	Annual Change
1999	16.2	--
2000	16.7	3.5%
2001	18.2	8.6%
2002	20.1	10.6%
2003	21.6	7.2%
2004	23.2	7.5%
2005	25.4	9.7%
2006	27.6	8.4%
2007	29.0	5.3%
2008	28.5	-1.8%
2009	27.6	-3.2%
2010	28.3	2.5%
Source: "*Bottled Water in the U.S. 2009 Edition" Beverage Marketing Corporation* and "Bottled Water Sales Return to Growth in 2010" *Vending Times* Vol. 51(6) June 2011.		

[4] "Bottled Water Sales Return to Growth in 2010" *Vending Times* Vol. 51(6) June 2011.

Table 2. U.S. Bottled Water Market: Volume and Producer Revenues

U.S. Bottled Water Market: Volume and Producer Revenues				
Year	Millions of Gallons	Annual Change	Millions of Dollars	Annual Change
2001	5,185.3	--	6,880.6	--
2002	5,795.6	11.8%	7,901.4	14.8%
2003	6,269.8	8.2%	8,526.4	7.9%
2004	6,806.7	8.6%	9,169.5	7.5%
2005	7,538.9	10.8%	10,007.4	9.1%
2006	8,255.0	9.5%	10,857.8	8.5%
2007	8,757.6	6.1%	11,551.5	6.4%
2008	8,669.3	-1.0%	11,178.5	-3.2%
2009	8,454.0	-2.5%	10,595.0	-5.2%
2010	8,750.0	3.6%	--	--

Source: *"Bottled Water in the U.S. 2009 Edition" Beverage Marketing Corporation* and "Bottled Water Sales Return to Growth in 2010" *Vending Times* Vol. 51(6) June 2011.

The bottled water industry includes manufacturing/bottling, wholesaling, and retailing. The industry is dominated by Nestlé Waters, a division of Switzerland-based Nestlé Corporation. Nestlé Waters bottles water under 64 brands worldwide (15 in North America). Nestlé Waters accounts for almost 35% of U.S. bottled water market share, and 18% of global bottled water market share. Its North American sales in 2008 topped $4.3 billion. Nestlé Waters North America currently manages 50 spring sites throughout the U.S. and has active efforts underway to identify additional springs in several states, including Oregon.[5]

2.3 Environmental Impacts of Bottled Water

The growing consumption of bottled water raises questions about the product's economic and environmental costs. The most significant concerns involve the water and energy resources required to produce bottled water and the quantity of plastics waste that either has to be recycled or disposed of in landfills.

[5] Information from *Nestlé Waters at a Glance 2009.* Available at: http://www.Nestlé-watersna.com/pdf/At_A_Glance_2009.pdf

The Pacific Institute (2011) estimates that it takes 3 liters of water to produce 1 liter of bottled water. Every liter of bottle water sold, therefore, represents 3 liters of water. Treating and disposing of wastewater is costly for municipalities. The diversion of this much water to produce bottled water for consumption elsewhere contributes to local water shortages. In India, for example, bottling fresh water for Dasani water and other Coca-Cola company beverages has contributed to water shortages in at least fifty villages.[6]

The most common water bottles are made of a plastic called polyethylene terephthalate, or PET. According to the Pacific Institute (2011), Americans bought a total of 31.2 billion liters of water in 2006, most of which were sold in (PET) bottles, requiring nearly 900,000 tons of plastic. The phthalate in water bottles is known to leach into water supplies, where it can cause reproductive problems, liver disease, and increased risk of cancer.

Plastic is produced from fossil fuels - typically natural gas and petroleum. It takes roughly 3.4 mega joules of energy to make a typical one-liter plastic bottle, cap, and packaging. To make enough plastic to bottle 31.2 billion liters of water in 2006, therefore, required more than 106 billion mega joules of energy. Producing those bottles for American consumption used more than 17 million barrels of oil and produced 2.5 million tons of CO_2, not including the energy used for transportation (Pacific Institute 2011).

Even more energy is required to fill the bottles with water; to move the bottles by truck, train, ship or air freight; to cool the bottles in grocery stores or home refrigerators; and to recover, recycle or throw away plastic water bottles. Gleick and Cooley (2009) estimate that producing bottled water and distributing it for final retail sale typically requires 5.6-10.2 MJ 1^{-1}per liter. The energy required varies depending on the mode of transportation and the distances traveled from the bottling plant to points of sale. In comparison, producing tap water requires about 0.005 MJ 1^{-1} for both treatment and distribution (Burton 1996). The energy required to make bottled water, therefore, is almost 2,000 times the energy cost of producing tap water. The total energy cost of satisfying Americans demand for bottled water in 2006, therefore, was equal to 29-53 million barrels of oil, roughly one-third of one-percent of U.S. primary energy consumption. Roughly three times this amount of energy was used to satisfy global bottled water demand (Gleick and Cooley 2009).

U.S. consumers disposed of 30.8 billion plastic water bottles in 2006. More than 85% of those plastic bottles ended up in landfills rather than being recycled. In that year, Nestlé controlled 30.4% of the U.S. bottled water market, measured in volume of water sold. Nestlé brands, therefore, may account for 7.86 billion of the empty PET plastic water bottles in U.S. landfills. That is equivalent to more than 4.9 million pounds of Nestlé plastic in the trash that is not recycled (Food & Water Watch 2009).

2.4 Consumer Backlash Against Bottled Water

As the environmental impacts and resource demands of the bottled water industry have become more apparent, many anti-bottled water campaigns have been launched in recent years. National campaigns such as *Take Back the Tap* and *Think Outside the Bottle* have been urging municipal governments to cut

[6] "Coca Cola: In Hot Water", *The Economist,* October 6, 2005. Available at: http://www.economist.com/node/4492835?story_id=4492835

off bottled-water contracts, to press for greater disclosure of the sources of bottled water, and to refuse to sell or offer bottled water in public buildings and events. Municipalities across the country, including San Francisco, Seattle, Takoma Park (MD), Vancouver (WA), Multnomah County (OR), and Clark County (WA) have passed resolutions banning the use of taxpayer's money on purchasing bottled water. All of these municipalities, and many more, are supporting an effort to counter marketers' claims that bottled water tastes better or is "healthier" than regular tap water to drink. New York City joined the movement by launching an ad campaign called "Get Your Fill" to promote the benefits of tap water. The U.S. Conference of Mayors has adopted several resolutions to bring attention to the negative environmental and resource impacts of bottled water and to encourage information sharing around the safety of municipal water and the impacts of bottled water on municipal waste. The U.S. Conference of Mayors encourages cities to phase out government use of bottled water and promote the importance of municipal water.

The demand for bottled water is fed by consumer beliefs that municipal water is inferior to bottled water in taste and in purity. Municipal tap water, however, is strictly regulated by the Environmental Protection Agency. As much as 40% of the bottled water on the market comes from municipal water systems, not springs. Bottled water is regulated by the Food and Drug Administration, but the FDA exempts 60-70% of the bottled water sold in the U.S. from its bottled water standards, on the grounds that its rules do not apply to water packaged and sold within the same state. Bottled water, therefore, is not necessarily cleaner than tap water (GAO 2009).

When consumers purchase bottled water, they are paying for packaging a product that is already delivered to their home via the tap at much lower cost. Households pay taxes to support municipal water systems. They pay taxes to dispose of municipal waste. As more consumers recognize the safety of our municipal water systems and the environmental impacts of bottled water, demand for bottled water may fall. The volume of bottled water sold in the U.S. peaked in 2007, though volume began to rise again in 2010 (table 2). The bottled water industry attributed the drop-off in sales to the sluggish economy, but a change in consumer preferences regarding bottled water may also have come into play. The success of anti-bottled water campaigns may slow or reduce industry growth in the future.

Nestlé brands of bottled water in the Northwest are currently shipped into the region from California and British Columbia. Nestlé's stated intent in building a bottling plant in Cascade Locks is to locate closer to its consumers.[7] The greater Portland metropolitan region, however, enjoys some of country's cleanest drinking water flowing out of the Bull Run watershed on the slopes of Mt. Hood. Portland is also widely known for its environmental consciousness and its strong policy support for sustainability objectives. If anti-bottled water campaigns succeed at all in changing consumer preferences, they are very likely to succeed in the Northwest.

[7] Information about the proposed Nestlé project retrieved from the Nestlé Waters North America website 8/1/2011: http://www.Nestléwaterspnw.com/projectOverview.aspx.

3. Nestlé's Proposed Bottled Water Plant in Cascade Locks

3.1 Cascade Locks – Background

Cascade Locks is a city in Hood River County, Oregon. The name was taken from a set of locks built to improve navigation past the Cascade Rapids of the Columbia River in 1896. The city is located just upstream from the Bridge of the Gods, which is the only bridge crossing the Columbia River between Portland and Hood River. It is located along Interstate 84 only 45 miles from Portland. The city is surrounded by the Columbia Gorge National Scenic Area. Development in the National Scenic Area is carefully regulated to protect the unique natural and scenic value of the area for the benefit of all Americans.

Because of its unique location, Cascade Locks is a beautiful location to live, work, and recreate. The city itself, however, is small. According to the 2010 census, the population of the area was approximately 1,144 people; 20.8% of the residents were under 18 years of age. There are only 502 housing units in Cascade Locks, 88.6% of which are occupied.

Manufacturing (14.4%) support the largest employment for city residents, followed by education, health and social services (14.3%); arts, entertainment, accommodation and food services (12.7%); construction (11.8%); retail trade (10.1%); public administration (8.22%); transportation, warehousing, and utilities (7.53%); and professional, scientific, management, and administrative services (7.19%). The majority of jobs are white collar jobs (53.4%). By job type, 25% of the labor force was employed in sales and office jobs; 20.7% was in production, transportation, and material moving; 17.1% was in services; 17.1% was in construction, extraction, and maintenance; 14.2% was in professional occupations; 5% was in management, business, and financial operations; and less than 1% was in farming, fishing, and forestry. Local, state, and federal governments account for roughly one-fifth of all employment in the city.

Median household income in Cascade Locks in 2008 was $45,200, equivalent to 85% of the state's median income of $53,500. In 2007, the average annual wage for all employees in the Cascade Locks zip code area covered by unemployment insurance was just under $32,500 - 82% of the statewide average wage of $39,600. According to the Mid Columbia Labor Trends in May 2011, the unemployment rate in Hood River County was 8.8% in March 2011 which is lower than the state's unemployment rate (10.5%) and the national unemployment rate (9.2%) (Hovee and Company 2009).

Cascade Locks supports a relatively low proportion of jobs in town given the number of residents. This means that a higher proportion of Cascade Locks residents must commute from home to find employment (Hovee and Company 2009). Creating a diverse mix of employment opportunities close to home is a top economic development priority for the city and Hood River County, but prospects for locating new industries to Cascade Locks are limited by its small land size and limits on expanding outside of the urban core into the National Scenic Area (Hovee and Company 2009).

3.2 Water Resources and Water Systems in Cascade Locks

Cascade Locks is located along the Columbia River, the largest river in the Pacific Northwest region of North America. The river rises in the Rocky Mountains of British Columbia, Canada, flows into the U.S.

and through Washington and Oregon before emptying into the Pacific Ocean. The river is the fourth largest river in the U.S. and it has the greatest flow of any North American river draining into the Pacific. Over the last century, there have been numerous dams built along the Columbia River and its tributaries for the purposes of power generation, navigation, irrigation, and flood control.

The river and its tributaries have been central to the region's culture and economy. This system produces more hydroelectric power than anywhere else in North America. The river and its tributaries are home to many species of anadromous fish, which migrate between freshwater habitats and the saline Pacific Ocean, including salmon and other species federally listed as threatened or endangered under the Endangered Species Act. Historically, abundant salmon runs provided subsistence for Indigenous populations in the region and salmon still figures prominently in the diet and culture of nearby tribal communities.

The average annual rainfall in Cascade Locks is 77 inches. August is the average warmest month while January is the average coolest month. The average wettest month is December. Typically, the precipitation rate is low from May to September, but high in October until April. Precipitation, therefore, is lowest during Nestlé's projected peak months for bottled water production.[8]

The alluvial gravels along the Columbia River just west of its confluence with Herman Creek extend below river level and contain a body of groundwater that is hydraulically connected with the river. The city maintains two storage reservoirs as well as wells adjacent to Dry Creek for supplemental and emergency municipal supply (Coccoli 2004). This groundwater resource provides the domestic water for the city of Cascade Locks (City of Cascade Locks 2001). Groundwater quality is considered good and the only treatment required by the city is chlorination.

The water system is typically divided into three sub-systems: production, storage, and distribution. The city's water infrastructure was established in 1935 and was built by the US Army Corps of Engineers (USACE). The system included the Dry Creek dam (production), Dry Creek reservoir (storage), and 7,300 ft of mainline to the distribution system (distribution). Dry Creek reservoir was the city's water arrangement until 1969 when the city agreed to remedy the turbid water entering from Dry Creek during winter months by supplementing this production system with a well near Herman Creek. In 1969, well #1 was built to assess the capacity of this cite. Well #2 was drilled and put into production a month later. In preparation for this new source, the city also built Oxbow reservoir in 1968 with a capacity of 350,000 gallons. This upgraded system served the city for the next 33 years until 1992, when the Oregon State Health Department (OSHD) mandated the city to install a filtration/treatment system to continue to use the water from the Dry Creek system. Instead of pursuing this relatively costly and higher maintenance facility, the city decided to move exclusively to a well production water system.

In 1992, Well #1 was put into production at the mouth of Herman Creek and the intake from the Dry Creek system was decommissioned. Then, Cascade Locks water supply comes from these two wells which draw water from the sandy gravels located below Herman Creek. These sandy gravels are not impervious to drainage so the Well Head Area needs to be treated with respect and care. The city

[8] Information about the proposed Nestlé project retrieved from the Nestlé Waters North America website 8/1/2011: http://www.Nestléwaterspnw.com/projectOverview.aspx.

chlorinates its water supply at the source to eliminate bacteria that may form within the water distribution system or bacteria that may come in contact with the drinking water due to a leak.

The two wells are currently the city's exclusive water production systems. Water is chlorinated at the wells and pumped directly to two reservoirs (Dry Creek Reservoir and Oxbow Reservoir), then dispersed to the community through a series of distribution mains. Well water rights total 4.7 cfs or 3.04 million gallons per day. The city's two reservoirs have a total storage volume of 0.596 million gallons (Dry Creek Reservoir, 246,000 gallons and Oxbow Reservoir, 350,000 gallons). As of 2000, additional water storage capacity is needed to help alleviate a low water pressure problem in the west side of the town. There are five areas in the city that have limited water flow for domestic use and fire fighting (City of Cascade Locks 2001). The two wells have a pump capacity of 846 gpm and 495 gpm, respectively, which is a total of 1.93 millions of gallons a day. The city pumped an average of 380,000 gallons per day with a peak about 500,000 in the first 6 months in 2007. The City of Cascade Locks is currently utilizing 150,000 gallons per day in the winter and 300,000 gallons per day in the summer ((Bureau of Indian Affairs 2010). Nestlé has proposed to draw 300 gpm (432,000 gpd) of municipal water, 225 of which will replace Oxbow spring water to the ODFW hatchery and 75 gpm directly as municipal water to bottle for sale.

3.3 Oregon Department of Fish and Wildlife (ODFW) Hatchery

Oxbow Hatchery is located approximately 1 mile east of Cascade Locks, Oregon, off Interstate 84. It is near Herman Creek 0.7 miles above its confluence with the Columbia River at about river mile 151. The hatchery was originally constructed in 1913 to provide additional rearing facilities for Bonneville Hatchery. It was relocated to its present site in 1937 following the construction of Bonneville Dam. Its operation began as a state funded facility. It was remodeled and expanded in 1952 as part of the Columbia River Fisheries Development Program (Mitchell Act) - a Federal program to enhance declining fish runs in the Columbia River Basin. Funding then shifted to 100% federal funds through the National Marine Fisheries Service (NMFS). The site is at an elevation of 100 feet above sea level, at latitude $45^{o}\,40^{'}\,32^{''}$ N and longitude $121^{o}\,51^{'}\,31^{''}$ W. The site area is 33.5 acres, owned by ODFW.

The ODFW Hatchery Management Policy defines hatchery programs as either harvest or conservation programs. Harvest programs operate to enhance or maintain fisheries without impairing naturally reproducing populations. Conservation programs operate to maintain or increase the number of naturally produced fish without reducing the productivity of naturally reproducing populations. Hatchery goals associated with Mitchell Act funding are to produce lower river coho that will contribute to NE Pacific and Columbia River Basin commercial and sport fisheries. Also, it has a short-term goal to utilize conventional supplementation to prevent the extinction of a wild Chinook population in the Grande Ronde Basin. An intermediate goal is the restoration of spring Chinook salmon in the Grande Ronde sub-basin using indigenous stocks. And the long-term goal is recovery, de-listing, and to mitigate for fish losses occurring as a result of the construction and operation of the four Lower Snake River Dams. Furthermore, the hatchery also aims to utilize conventional supplementation, in conjunction with a captive broodstock program to prevent the extinction of the native Red Lake Sockeye population, to provide a future basis to reverse the decline in stock abundance, and to ensure a high probability of population persistence into the future. The hatchery at Oxbow is used for interim egg incubation and early rearing of coho sockeye. No adult fish are collected or spawned at Oxbow and there are no fish released at the facility.

The hatchery has three satellite facilities. Upper and Lower Herman Creek ponds are used as interim rearing sites for coho transferred in from other facilities. Upper Herman Creek ponds are located about 1/4 miles east of the main hatchery adjacent to Herman Creek at about river mile 0.7. This facility began its operation in 1977. The site is at an elevation of approximately 85 feet above sea level. Lower Herman Creek ponds are located near the mouth of Herman Creek approximately ½ miles north of the main hatchery. The site is at an elevation of 80 feet above sea level. This facility began to run operate in 1952. In 1990, extensive upgrading of the ponds was done to allow for juvenile rearing. Wahkeena Pond is located about 16 miles west of the hatchery adjacent to the Columbia River at river mile 134. The pond began its operation in 1961. Elevation of that pond is 40 feet above sea level.

The hatchery obtains its water supply from Oxbow Springs through gravity flow. The water rights are for 116.51 cubic feet per second (cfs). A total of 5.0 FTE's is used to operate Oxbow Hatchery and the satellite facilities[9]. The operation of the hatchery is impeded by seasonal water flows. Walters (1989) did an evaluation and concluded that the Oxbow Hatchery was at capacity but was limited by low water flows from August through January.

3.4 Proposed Bottling Plant

Nestlé has considered the prospects for building a bottled water plant in Cascade Locks since at least 2008. The proposal as it now stands would involve a $50 million investment by Nestlé to construct a 250,000 square feet state-of-the-art two-line production facility in Cascade Locks. According to Nestlé, the plant would support 53 jobs, 48 of which would be open to the local employment pool. The Nestlé plant would bottle spring water and municipal water from the city of Cascade Locks under its Arrowhead and Pure Life brands of bottled water respectively.[10]

Nestlé wants to buy the spring water directly from Cascade Locks; the water right to Oxbow Springs, however, is owned by ODFW. For this arrangement to work, the city of Cascade Locks and ODFW would have to agree to, and the state would have to approve, a water rights exchange, whereby ODFW would provide a portion of Oxbow Springs water to the city so that the city could sell the spring water to Nestlé as a municipal water customer. To compensate for the water taken away from the hatchery, the city will redirect well water to the hatchery.[11]

The Oregon Department of Fish and Wildlife and the city of Cascade Locks entered into an Intergovernmental Agreement on June 22 in 2009 that laid out basic ground rules for the water rights exchange process. The document indicated that the water rights exchanged to the city should be 0.5 cfs. This means that if the city were to sell all of its water procured from Oxbow Springs to Nestlé, Nestlé can pump at most 0.5 cubic feet spring water per second, which is about 225 gallons of spring water per minute or 118,260,000 gallons a year. Thus, Nestlé could extract 118 million gallons of spring water from Oxbow Springs per year if the water rights exchange is approved.

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[9] Oregon Department of Fish and Wildlife, 2011. "Oxbow Hatchery Operations Plan 2011" .Available at: http://www.dfw.state.or.us/fish/HOP/Oxbow%20HOP.pdf.

[10] Information about the proposed Nestlé project retrieved from the Nestlé Waters North America website 8/1/2011: http://www.Nestléwaterspnw.com/projectOverview.aspx.

[11] Ibid.

ODFW could benefit from the water rights exchange because it would allow for the establishment of a new non-seasonal supply of pathogen free water to the Oxbow Hatchery. The city of Cascade Locks could benefit by attracting a new commercial customer for municipal water supplies and a new employer to the region that can contribute to the city's tax base. This arrangement would represent a first-of-its-kind de-facto partnership between a state agency and Nestlé. The state will receive no compensation from Nestlé for the diversion of water from the hatchery. The water rights exchange will require a pipeline to be constructed from Oxbow Springs to the Nestlé plant and from the municipal water supply back to the hatchery. Nestlé has stated that it will pay for the costs of constructing this pipeline and related infrastructure, though it has not necessarily agreed to maintain that infrastructure over time.

The way the Nestlé proposal is structured Nestlé will not actually obtain water rights in the Columbia Gorge. Nestlé will purchase its spring water and municipal water from the city of Cascade Locks as a commercial water customer. It will presumably enter into long-term contracts with the city to purchase this water at a specified price. What that price is, and whether it will be sufficient to cover the opportunity costs of the water as well as additional expenses and costs related to the project is unknown.

Bottled water is profitable because consumers are willing to pay for the "value added" to spring water or municipal water treated and bottled for sale. The average market price for bottled municipal water under the Pure Life brand is $5.39 for 24 bottles (500 ml/bottle). This is equivalent to roughly $1.70 per gallon of bottled municipal water. The average market price for Arrowhead (bottled spring water) is $4.19 for 12 bottles (500 ml/bottle), or roughly $2.63 per gallon of spring water.

The price the city of Cascade Locks will charge Nestlé for access to its municipal water for bottling and for compensating the hatchery for the loss of spring water is unknown. The city currently charges households and businesses the same rate for water. The published rate as of August 2011 is $2.25 per 1,000 gallons of water, or roughly $0.00225 per gallon.[12] At these rates, water purchased from the city of Cascade Locks could be resold as bottled water at very high mark-ups. Water sold by the city for $.00225 per gallon could be resold by Nestlé as bottled spring water or municipal water for $2.63 and $1.70 per gallon. This doesn't include wastewater fees, utility costs, labor costs, and any and all other production and distribution costs Nestlé would incur to produce and sell bottled water. Nestlé's actual profit per gallon would presumably be lower. Nevertheless, there is obvious room within these margins to require that Nestlé take on more of the costs and risks associated with this project while still profiting. This is why a thorough analysis of the costs of this project need to be further explored. Below we identify the major potential costs associated with the proposed Nestlé bottling facility.

3.5 Infrastructure Related Costs

Wastewater

In 1998, the City of Cascade Locks completed construction of a new wastewater treatment plant (WWTP), which serves the entire city. The city's WWTP has a design capacity of 480,000 gpd. It is currently operating at 20% of total capacity at 100,000 gpd (City of Cascade Locks 2005). Nestlé's two-

[12] City of Cascade Locks webpage at http://www.cascade-locks.or.us/index.asp?Type=B_BASIC&SEC={019356B6-571C-4414-A602-9913B1B4C753}

line production facility will require 300 gpm. According to Nestlé, its facility will use 1.3 gallons of water for every one 1 gallon of water bottled. The plant, therefore, could produce almost 70 gallons of wastewater per minute. The Pacific Institute (2011) estimates that bottled water, on average, requires 3 gallons of water for every 1 gallon produced. By this estimate, Nestlé's plant will produce 200 gallons of wastewater per minute. This range of estimates of potential wastewater is within the capacity of the city's existing wastewater treatment plant. If the plant generates wastewater at the high end of this range, and if the city's wastewater needs remain constant, wastewater treatment will approach 80% of wastewater capacity. Additional investments in wastewater capacity may not be needed.

The costs of treating wastewater, however, may continue to rise. In many areas, it now costs more to get rid of wastewater than to supply drinking water. Increases in water bills across the country have been driven primarily by increases in the costs associated with wastewater treatment, especially as municipalities adopt more stringent environmental standards. According to Linkov et al. (2007), the cost of industrial wastewater treatment varies between $0.38 and $1.52 per gallon of untreated water. Using these estimates, the costs of treating wastewater from the Nestlé plant could be as high as $39.9- $159.8 million per year. To recover these costs, they would have to be reflected in the prices charged to Nestlé as a municipal water customer.

Cascade Locks charges commercial customers sewer rates commensurate with the amount of water they consume, not the amount of wastewater they produce. It charges a flat rate of $45.50 for the first 5,000 gallons of water consumed and then $8.77 per 1,000 gallons thereafter. A fixed rate system works well for customers who produce more wastewater per gallon of water consumed than others on average. If Nestlé is charged for the 300 gpm of combined municipal water and sewer water at the same rate as other commercial customers, it could pay as much as $1.4 million to the city in sewer/wastewater fees.

Electricity

The city of Cascade Locks purchases power from the Bonneville Power Administration and distributes electrical service to the residents and businesses of Cascade Locks. Electricity costs in the region are relatively low, due to the abundance of low cost hydropower supplies. The city has a 6 MW substation, the Cascade Locks Substation (CL Substation) located on the north side of I-84 and south of the Port of Cascade Locks Industrial Park on the SDS Lumber property. This substation was constructed in 1972 and provides 4.6 MW of service to the city's customers. The city utilizes 77% of its electrical service capacity (Hovee and Company 2009).

Since the City of Cascade Locks is currently utilizing 4.6 MW of the available 6.0 MW, the city plans to expand its substation and add transformers. This upgrade would increase the city's power supply and expand the reliability of the electrical distribution system (BIA 2010). The amount of electricity Nestlé will need to operate its facility is unknown; though estimates mentioned in public meetings and reported in *Lock Tender*, the city's newsletter, suggest that Nestlé may require 1-2 MW. If this is the case, the addition of the Nestlé plant to the city's existing energy demand may require investments in upgrades to the electricity infrastructure. Even if Nestlé's energy demands are lower, the city is already operating close to capacity. The addition of a major industrial consumer will limit capacity for future growth and development, unless those investments are made. For example, the proposed Cascade Locks resort and casino project, had it been approved, would have required an expansion of the City's electrical service capacity (BIA 2010; Hovee and Company 2009)

Transportation

Nestlé projects that 100 trucks per day (200 truck trips) will travel I-84 to and from Cascade Locks during its peak bottled water production period between May through September.[13] This will increase wear-and-tear for existing roadways and may require investments in new roadways and repairs. Nestlé representative Dave Palais stated in public meetings that Nestlé will not pay for the necessary road upgrades for the truck traffic associated with the water bottling facility.

The Cascade Locks study area for this transportation analysis includes I-84 and the local streets that accommodate the majority of travel within the community. Given its high speed and capacity, and limited alternative routes, I-84 provides the primary city-to-city roadway connection to Cascade Locks. I-84 is classified in the Oregon Highway Plan as an interstate route, the highest level of classification in that plan. It has three partial interchanges with Cascade Locks roadways: the West Cascade Locks Interchange (MP 43.66, Exit 44), the East Cascade Locks Interchange (MP 45.05, Exit 44), and the Herman Creek Interchange (MP 47.31, Exit 47). The primary routes within the City of Cascade Locks are WaNaPa Street, Forest Lane, and Frontage Road. These three streets provide connections between uses within the city and I-84 (BIA 2010).

As Portland is the closest metropolitan area to Cascade Locks, the main traffic flow from the Nestlé bottled water facility will head west 43 miles to Portland through I-84. This establishes a clear target for estimating the potential costs associated with road maintenance and upgrade along I-84. In the U.S., states, with support from localities and the federal government, are primarily responsible for building and maintaining the highways, roads, and bridges, with significant financial support from the federal government. There are several variables which may affect the costs of the construction of highway projects such as terrain type (mountainous or flat), development type (rural or urban), geographic location (high cost or low cost state), type of highway (interstate freeway or two-lane local highway), material type (concrete or asphalt), and pavement thickness (which depends largely on projected auto and truck volumes). Costs may also differ depending on whether the project involves construction of a new highway or adding lanes to an existing highway.

A study was completed in 2003 by the United States General Accounting Office (GAO) for the Federal Highway Administration (FHWA) to help provide estimates of highway construction cost per lane-mile based on information from several states on the current design procedures and cost factors. The study finds that road widening costs range from $2.4-$6.9 million per lane-mile in urban areas and $1.6-$3.1million per lane-mile in rural areas. For densely developed urban areas or environmentally sensitive areas, the costs may be as high as $7.3-$15.4 million and $5.8-$9.9 million for construction in urban and rural areas, respectively. For new construction, to build one lane-mile of a typical divided highway can range from $3.1 million to $9.1 million per lane-mile in rural areas depending on terrain type and $4.9 million to $19.5 million in urban areas depending on population size. However, in urban areas restrictions (high cost of additional right-of-way, major utility relocation, high volume traffic control, evening work restrictions, etc.) may increase the cost per lane-mile. If restrictions exist, the cost to construct one lane-mile of a 4-lane divided highway can range from $16.8 million to $74.7 million.

[13] "Traffic Fact Sheet" Nestlé Waters North American. Available at:
http://www.Nestléwaterspnw.com/documents/CL_Traffic_Factsheet_November2010_Final.pdf

Washington State Department of Transportation (WSDOT) completed a survey including questions related to the cost of highway construction in 25 states and published the final report in 2002. In the survey, participants were also asked to identify the range of variability of project cost associated with right of way (ROW), pre-construction environmental compliance, and construction environmental compliance and mitigation. According to the WSDOT report, the construction costs for a diamond interchange in Oregon is $8,613,464. The construction cost for a single lane mile in Oregon is $2,112,486. These estimates can be used to determine the costs of building and upgrading road infrastructure to accommodate truck traffic from Nestlé's plant.

I-84 is already a major thoroughfare for tractor truck traffic traveling east and west from Portland. The addition of 200 truck trips per day over the 43 miles between Portland and Cascade Locks may require upgrades and maintenance at taxpayers' expense. In addition, the city of Cascade Locks will likely need to invest in improving truck access to and from I-84 along local roads to the facility. These costs and the implications for taxpayers should be carefully considered.

3.6 Other Costs Associated With the Project

The costs associated with the proposed bottling facility go beyond impacts to public infrastructure. The increased truck traffic has serious implications for noise pollution, accidents, and air quality. These concerns are especially great given the location of Cascade Locks within the Gorge National Scenic Area.

Tourism

Because of the spectacular natural beauty of the Columbia Gorge, tourism is important to the economy of Hood River, accounting for an estimated 1,030 jobs. Cascade Locks, as the only city between Portland and Hood River, is the natural focal point for the county's tourism economy. The tourism industry, though not large comparable to other heavily visited areas in the state, has steadily grown over the last decade. From 2002 to 2007, total direct tourism spending increased by 135% in Hood River County; statewide tourism spending only increased by 33% over that same period. As of 2007, visitors spent an estimated $72 million in Hood River County. Expenditures on food and beverage services accounted for 30% of tourism-related expenditures. Despite the proximity of the Columbia Gorge to the Portland metropolitan areas, the proportion of visitor spending on accommodations (30%) in Hood River County was higher than the statewide average (23%) (Hovee and Company 2009).

Expenditures on tourism contribute to additional economic activity in the region through a process known to economists as the multiplier effect. For example, when a tourist spends money in a local restaurant, the restaurant owner uses some portion of that expenditure to pay for inputs, including the food and labor needed to prepare the meal. This represents a new source of income for the workers employed there, as well as for many local growers and other suppliers in the area. If those local suppliers or employees then spend their new income on goods and services produced by local businesses, the economic impact of the initial tourism expenditure multiplies. But the process works in reverse as well. A decline in tourism spending will result in a more than proportionate decline in economic activity in the area. For this reason, a careful analysis of the impact of a Nestlé bottling facility on tourism in the area is critically important, especially since the county has identified tourism and recreation as one of its main economic development priorities (Hovee and Company 2009).

The costs related to tourism, however, involve more than the forgone expenditures and multiplier effect. The proximity of the Gorge to Portland means that many people visit the area for day trips, never stopping to spend money in local shops, hotels, restaurants or outfitters. If the bottling facility contributes to traffic congestion, noise, and air pollution, as well as general unsightliness, this will impact the welfare of tourists, independent of how much they do or do not spend on tourism related activities. This represents a real economic loss to the users of the Gorge that should be factored into any benefit-cost analysis of a proposed Nestlé bottling facility. To do this would require extensive surveying to determine the value these tourists place on visiting the area in its current state.

Carbon Emissions

Carbon emissions, which contribute to global warming, are directly related to fossil fuel energy consumption. Oregon has emerged as a national leader in setting ambitious goals to reduce carbon emissions and transition to clean renewable energies. The bottled water industry, with its large carbon footprint, seems at odds with the state's goal to embrace and develop the clean, high tech, green industries of the future.

The two main sources of carbon emissions from the Nestlé bottling facility are vehicle emissions from transporting bottled water product and the production of plastic bottles. Nestlé is not planning to produce plastic bottles at its plant in Cascade Locks, but the carbon embedded in those bottles is part of the carbon footprint of bottled water. It takes 1.4-5.8 mega joules of energy for transporting 1 liter of bottled water (Gleick and Cooley 2009). According to the Pacific Institute (2011), it takes 3.4 mega joules of energy to make a typical one liter plastic bottle, cap, and packaging. Thus, a total of 4.8-9.2 mega joules of energy will be required to produce the plastic and transport 1 liter of bottled water.

The Nestlé plant in Cascade Locks is expected to produce 198,960,624 liters of bottled water per year. The energy required to produce this amount of bottled water will be .96-1.8 billion mega joules of energy. A barrel of oil is equivalent to 6,000 mega joules of energy (Gleick and Cooley 2009). Therefore, Nestlé's bottled water production in Cascade Locks may require as much as 159-305 thousand barrels of oil. Given the carbon content of oil, 1 barrel of oil produces roughly 400 kg CO_2. This means that the Nestlé bottled water facility may contribute an additional 64-122 million kg of CO_2 annually.

Underground Water Supplies

There are two major external costs associated with the exploitation of groundwater supplies: stock externality and risk externality. The stock externality arises because the pumping decision of each user using the groundwater resource is constrained by the total ground water stock. Risk externality indicates the income risk for all users (firms and households) who are affected by the total amount of groundwater stock available for pumping. An individual user has no incentive to conserve on its withdrawal of groundwater use. This is why access to groundwater is typically regulated.

In this project, the city of Cascade Locks maintains the water rights and enters into contracts with Nestlé to sell municipal water. The risk of over-exploiting groundwater supplies in the region, therefore, lies entirely with the city of Cascade Locks. Even if the quantity of water demanded by Nestlé is within the production capacity of the city's two wells, this water extraction may have an impact on groundwater levels. Recent studies suggest that groundwater levels have been declining in these areas (USGS 2010).

The U.S. Geological Survey (USGS) conducted a regional assessment of groundwater levels during spring 2009 based on an inventory of 1,752 wells in the Columbia Plateau of Washington, Oregon, and Idaho. Results indicate trends toward water level declines in many areas since 1984. Of the wells measured in 1984 and 2009, water levels declined in 83 percent of the wells. Declines greater than 100 ft and as great as 300 ft were measured in many wells and the groundwater-level changes were greatest in the deeper hydrogeologic units.[14] These declines are in areas known to rely heavily on groundwater for irrigation, pumping, and other uses. The uncertainty of how climate change may impact the hydrological cycle and groundwater supplies in the region adds additional risks to the city from Nestlé's proposal. Water, though it seems plentiful in the Gorge, may not always be so plentiful.

4. Alternative Economic Development Path for the City of Cascade Locks

The City of Cascade Locks updated its Comprehensive Plan in 2009. As part of the planning process, the City commissioned an Economic Opportunity Analysis (EOA) to identify economic development opportunities and corresponding employment and land needs over the next 20 years. The city identified the following economic development objectives to guide the Economic Opportunity Analysis:

- *Create an extensive base of diverse employment opportunities inside of the Industrial District in the manufacturing, recreation, and tourism sectors.*
- *Assure the development and sustainability of a vibrant and economically viable downtown.*
- *Foster and support a recreation and tourism based economy throughout the Gorge, with Cascade Locks serving as a focal point.*
- *Support the development and success of businesses providing for the day-to-day needs for goods and services of Cascade Locks citizens.*
- *Develop a business sector that serves as a strong partner with and supporter of the community.*

Source: Hovee and Company 2009

The Nestlé bottled water plant, though not necessarily counter to the goals listed above, will utilize resources and infrastructure that could be allocated to businesses and industries that are more closely aligned with this strategy. What might those opportunities look like and how might they compare to the Nestlé bottled water plant?

The ideal industry would create local employment, contribute to the tax base, and sustainably draw on the region's natural competitive advantages and amenities. Nearby The Dalles, Oregon provides an instructive example of an alternative development strategy. The Dalles is situated in the north-central part of the state on the Columbia River. It is the largest city and county seat of Wasco County, with a

[14] For Cascade Locks area, aquifers are comparably shallow: 100 feet at city well field and less than 50 feet at Oxbow Springs.

population of 12,156 people. Located on the Columbia River, it provides an ideal distribution and manufacturing setting with available riverside locations, as well as bulk container and international shipping options. It links major transportation routes between Eastern and Southern Oregon and Washington State. The city serves a trading area of about 70,000 persons in Washington and Oregon. Its major industries include agriculture and tourism, along with health care government, and retail services. For residents, it offers the pleasure of rural living while providing the advantages of access to metropolitan amenities in Portland, which is only 80 miles to the west.

In 2006, Google began building a major data center, known locally as Project 02, along the Columbia River in The Dalles, using the area's reliable hydroelectric power and the underutilized fiber optic capacity of the area. The new complex includes two buildings, each approximately the size of a football field, and two cooling plants, each four stories high. The whole investment was $600 million. The project created hundreds of jobs in the area, mainly in construction. And today they are fully operational with about 200 permanent positions on site. Since the data center was constructed, local real estate prices have increased 40%.

The Google data center brought high-salary employees with higher levels of education and human capital to the area. This helps to bolster wages for local residents as well. The average annual incomes range from $40,000 to $60,000, and 90% of owners and their employees have health insurance. By comparison, average annual wages in Hood River County are $24,000 and a smaller percentage of workers have health benefits (Rafter, 2008). Google also provided a $100,000 grant to The Dalles to build and operate a Wi-Fi cloud that covers the city's business district.

The city of Cascade Locks possesses similar natural resources and amenities as The Dalles: access to fresh water, low cost hydroelectric power supplies, Columbia River access, and situated along I-84. Cascade Locks has the added advantage of being much closer to Portland, but its population is smaller. It may be possible to bring high-tech companies or clean energy industries to Cascade Locks to improve the local economy while protecting the area's natural and scenic amenities.

All across the state, Oregon is beginning to recognize the job creation and economic development potential of shifting to industries and economic activities that draw competitive advantages from the natural wealth and amenities of the region. For example, a recent report from the University of Oregon found that $1 million dollars of public investment in restoring an Oregon watershed creates 16-24 jobs and $1.4-2.4 million in additional economic activity. Ninety-percent of the money spent on conservation projects stays in-state; eighty-percent remains in the county where the project is located (Nielsen-Pincus and Moseley 2010). National studies of the job creation potential of restoration as compared to other industries find similar results (Heintz et al. 2009a and 2009b). The economics literature, therefore, increasingly demonstrates that Oregon can create jobs while preparing for the resource and environmental demands of the future.

5. Conclusion

Nestlé's proposal to build a $50 million dollar bottled water plant in the city of Cascade Locks offers new jobs and tax revenues. The proposal, however, is not a straightforward win-win opportunity for either the city or the state. For the bottled water plant to be successful, Nestlé needs access to spring

water that currently flows out of Oxbow Springs and is used for an ODFW hatchery. To obtain access to this water, Nestlé needs the city of Cascade Locks to negotiate a waters rights exchange with ODFW on its behalf. If the exchange is approved by the state, the city would be able to sell .5 cubic feet per second of spring water to Nestlé at a rate not yet determined. The state, however, would receive no compensation from the city, or from Nestlé, for the exchange of the water. Rather, Nestlé has agreed to pay to construct a pipeline from the municipal water supply to the hatchery. The plan, if approved, would allow Nestlé to bottle as much as 118 million gallons of spring water from Oxbow springs per year under its Arrowhead brand.

In addition, Nestlé plans to bottle municipal water under its Pure Life brand. This means that Nestlé, in total, will draw 300 gpm of municipal water to use as bottled water or to replace spring water redirected from the hatchery to use in bottled water. The long-term capacity of the city's groundwater to supply this much water is uncertain, especially in light of climatic changes that are expected to impact hydrological cycles. The risk of depleting groundwater supplies, in this case, falls on the city of Cascade Locks, not Nestlé. This is one of many potential risks to taxpayers that need to be further explored before the proposal moves forward.

The proposed Nestlé plant would also rely on the region's electrical service, roadways, and wastewater treatment facilities. Roadway improvements and repairs will almost surely be needed to support the truck traffic coming to and from the plant; Nestlé has not agreed to pay for these expenses. The city may also need to upgrade its electric service capacity; it is currently operating at near 80% capacity. Though the city's wastewater treatment capacity may be adequate to support Nestlé's needs, the demands on existing infrastructure need to be fairly reflected in the price charged to Nestlé as a commercial water customer. Before the proposal goes forward, the impacts to public infrastructure have to be more fully evaluated, especially in light of what alternative development opportunities the project may preclude.

The city of Cascade Locks is looking to create diversified employment opportunities, especially those that can foster and support a recreation and tourism based economy in the Gorge. The bottled water plant, however, will contribute to noise and air pollution, as well as a loss of aesthetic value in the area. This could adversely impact tourism and recreation in the Gorge. The Gorge is a National Scenic Area, valued for its natural beauty and scenic vistas. It is difficult to balance the region's economic development needs against these larger social and environmental objectives; finding the right industries that can deliver jobs and tax revenues while protecting the natural resources and amenities of the area is key. Yet, the Nestlé bottled water facility would exact heavy demands on natural springs and groundwater supplies for the benefit of only 48 local jobs.

This report detailed many of the potential ways that the proposed Nestlé bottled water facility may cost taxpayers in Oregon. In light of these costs, it is important to view the decision to bring a Nestlé bottled water plant to Cascade Locks as an investment on the part of the city and the state. Bottled water, however, is a resource intensive and energy intensive industry that exacts heavy environmental costs. Moreover, bottled water is no safer to drink, and in fact may be less safe to drink, than tap water in most areas of the country (GAO 2009). Investing in alternative development opportunities for the region that can create local employment, contribute to the tax base, and more sustainably draw on the region's natural competitive advantages and amenities may better serve the interests of Oregonians over the long term.

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