Corps of Engineers Walla Walla District Responses to Comments on the Dworshak Reservoir Nutrient Supplementation Project Environmental Assessment and Draft Finding of No Significant Impact

Background

On January 18, 2012, The U.S. Army Corps of Engineers, Walla Walla District (Corps) issued an environmental assessment (EA) and draft Finding of No Significant Impact (FONSI) on its proposed Dworshak Reservoir Nutrient Supplementation Project for a 30-day public review and comment period. The comment period was to end on February 16, 2012 but was extended for another 30 days with a revised ending date of March 17, 2012. During the review and comment period, the Corps received comments from 24 individuals. This paper identifies the major issues raised in the submitted comments and provides a response to each issue.

<u>Comment #1</u> (Comments supporting the Nutrient Supplementation Project)

"I approve. I hope you start the project again."

"I am all for fertilizing Dwarshak [sic Dworshak] to improve fishing."

"We live in Clearwater county and are in FAVOR of the nutrient program."

"We would like to express our support for the Dworshak Nutrient Supplementation Program."..."It also appears based on the information available to the public that the Corps is taking the necessary steps to insure public safety." "I know it has helped the fish grow both in size and quality."... "We have not seen any ill effects from the nutrients."..."We spend a lot of time on the lake with both family and clients that swim in the lake and none have had any problems."..."I would like to see the project continue."

"In the last several years the bass fisheries has improved, public use of the reservoir for fishing during "low pool" times has improved and the overall view of the receptionists options on the reservoir has improved."..."I support the Corps continued efforts to stick to the facts of the nutrient program."

"Please accept this letter as support to the "Nutrient program" going on at Dworshak reservoir. My family uses the Reservoir every summer and have for the past 30 years and have never felt there is a health or environmental concern. Keep up the good work, the scientific studies that have been done are enough to convince me that my children and grandchildren are safe."

"I feel that the science overwhelmingly indicates that this is a good project..."..."I am asking you to continue the enhancement project."

"I believe the nutrient program has helped the fish grow larger and in more numbers."

"As an avid user of Dworshak Reservoir, I urge the Corps to continue this project."

"I support the nutrient project."..."I feel between Idaho Fish and Game, the Corp of Engineers and the limnologist this nutrient project is being closely monitored."

"Please continue with the addition of nitrogen to help balance nutrient levels in Dworshak Reservoir."

RESPONSE #1: The Corps appreciates your interest in the proposed project and has taken your comments into consideration as part of the *Dworshak Reservoir Nutrient Supplementation Project.*

Comment # 2

"Let the project continue, analyze the results, stop if the science shows negative results and report back to the community the findings."

RESPONSE # 2: Under the Corps' National Pollutant Discharge Elimination System permit issued by the Environmental Protection Agency, monitoring and the reporting of monitoring results would be done on a monthly basis. Sampling would occur at eight locations, including one site on the North Fork Clearwater River below the dam. Currently established monitoring sites would be used for comparison with historic data.

<u>Comment # 3</u> (Comments on extending the EA and draft FONSI public review and comment period)

"We respectfully request a 60 day extension for you to receive public comment."

"...I feel that no extension of the comment period is necessary."

"Please extend the comment period."

"I want an extension of the comment period you have imposed by a minimum of 60 days."

"Also to ask for a extension of the comment period you have imposed by a minimum of 60 days."

RESPONSE # 3: The public comment period was extended for an additional 30 days (i.e. February 17, 2012 to March 17, 2012).

<u>Comment # 4</u> (General comments against the Nutrient Supplementation Project)

"Please stop the Dworshak Nutrient Project which is ruining our reservoir."

"The study needs to be stopped now, before our recreation is totally lost."

"Please don't use the Nutrient Supplement on our D. Lake."..."Please don't ruin our lake."

"Please halt or do not restart this project ... "

"I feel we need to take stand and stop the continuation of the proposed Dworshak ecosystem stewardship pilot study in 2012."

RESPONSE # 4: The Corps appreciates your interest in the proposed project and has taken your comments into consideration as part of the *Dworshak Reservoir Nutrient Supplementation Project*.

Comment # 5 (Blue-green Algae Blooms & Health Concerns)

"We had company from IL. Took them to the lake to swim. Both of their children got rashes and itch."

"I am very concerned about our water quality since this experiment started. The toxic Blue-green algae bloom has caused people to get rashes from swimming."..."Why in the world when only about 25% of the people who use our Res. to fish, are given priority to people & families who just want to swim? And why would we want to endanger their health and safety by polluting the waters for a fish?"..."These studies are linking ALS, Parkinson's and Alzheimer's to the toxins found in blue-green algae. The same blue-green algae that this "Experiment" got growing profusely. And our town of Ahsahka, ID. gets their drinking water from the Reservoir."

"Too many negative/health issues have occurred with the implementation of liquid fertilizer."..."We must protect our future and put our dollars into more SAFE and PRODUCTIVE avenues for our families future use of Dworshak as there are findings (medically) ER visits that significantly impact our health from the exposure of the liquid fertilizer in the forms of rashs [sic *rashes*]over our bodies."

"There exists not one mention of the word algae, or for that matter, any problems with water quality in the Corps (or anybody else's) records for nearly 40 years, until after 2007 and the start of the nutrient enhancement project."..."After the project began, there appears to be all kinds of water problems associated with the addition of nitrogen, the nature of which are supported by discussions (emails etc.) about "swimmer's itch", "rashes", "burning eyes", "pea-green water,""foam," and the presence of toxic bacteria, providing proof that indeed there are water quality problems at Dworshak. But, these problems started after 2007 and the commencing of the nutrient enhancement project, currently, being referred to as "The Nutrient Supplementation Project."

"My grandson developed a bright, red rash after swimming in Dworshak Reservoir in June of 2009. Can you tell me: Will he suffer long term health effects from this exposure; nerve damage; liver damage? The truth is, you don't know and neither do I, and that is reason enough to stop this destructive enhancement or supplement project, whatever you choose to refer to it as. The water in Dworshak Reservoir, in less than two years after "voluntarily" suspending this project, is again clean, clear and safe to swim in; why not leave it that way."

"The appearance of algae mats seems to be coterminous with the Nutrient Enhancement Program. People have also reported foam covering large areas of the reservoir as a result of the program. Though ACOE has denied the link between the treatments and the algae blooms, that seems unlikely. Besides what is already known about the toxicity of the toxins in blue-green algae, there is emerging evidence that exposure to it could be far more serious."

"The project reports and Fact Sheet claim that microcystins have never been detected in any of the samples. But on August 8, 2008, an email was sent to Corps from the Dworshak Reservoir Association stating that some reservoir users are complaining of skin rashes, burning eyes, and the smell of a stagnant pond (Attachement1). Skin rashes and burning eyes are indicators of the presence of microcystins."

"..., the toxic effects of microcystins can have much greater health issues than rashes or burning eyes. If ingested, it can cause gastroenteritis, liver and/or kidney toxicity, and neurotoxicity."

I have no doubt that Dworshak Reservoir had blue green algae prior to the nutrient enhancement project, and it is certainly feasible that there was the occasional localized minor bloom. However, based on my observations and the observations of others I have talked to in the community, if these blooms did occur, they were very minor, essentially non-events, and paled in comparison to what has happened since the addition of fertilizer. I fully understand the science and theory behind the N:P ratio, and if that ratio gets too low, the environment would favor blue greens over non-toxic algae. This theory however, has not yet been shown to be applicable at Dworshak Reservoir. In spite of (or as a result of) the addition of Nitrogen, large, dense Microcystis blooms have occurred."

"Throughout the country, Microcystis blooms are usually related to excessive nutrients from agricultural runoff. In this instance, it is not runoff, but rather the direct application of agricultural fertilizer."

"For the second time, I have thoroughly reviewed the "Dworshak Reservoir Rationale for Nutrient Supplementation for Fisheries Enhancement". This is supposedly the guiding document for the project. According to this report, the reservoir had very abundant pico-phytoplankters and moderate densities of toxin-producing blue greens prior to nutrient enhancement. There is no mention of "algae blooms" anywhere in the document. I can only assume there are no records of blue green algae blooms prior to nutrient enhancement, and that's why there is no summary of such blooms in the project background document. That noted, it is illogical and irresponsible of the Corps to conclude anything other than the application of fertilizer to Dworshak Reservoir has resulted in significant blue green algae blooms in 4 out of 5 years since the project began."

RESPONSE # 5: The Corps acknowledges that at times there has been a relatively high density of microcystis species (i.e. blue-green algae) in Dworshak Reservoir including both prior to and after the period of fertilizer application (i.e. 2007 - July 2010). However, the Corps presently has no evidence nor has any been presented to the Corps that shows the nutrient supplementation project is the principle cause of the growth of microcystis species.

The following information comes from the <u>Dworshak Reservoir Nutrient</u> <u>Enhancement Project 2011 Progress Report and Data Summary</u> prepared by Darren Brandt, Advanced Eco-Solutions Inc., March 2012. The Corps concurs with the comments.

The seasonal total biovolume of Microcystis species from 2007 through 2011 has been around 0.3 mm³/L with the exception of 2009, where the

biovolume reached 1.8 mm³/L. When biovolume as a percentage of the total community seasonal biovolume is examined, the Microcystis species values observed in 2011 were similar to past years, (see figure 41). The percentage of the phytoplankton community made up of Microcystis does not appear to be related to nitrogen supplementation. (The Corps will be doing appropriate monitoring and testing throughout the duration of the nutrient supplementation project.)



Figure 41 Biovolume as a percentage of the entire phytoplankton community by year. The data is from all depths, stations, and sampling events from each year. The samples collected to investigate blue-green blooms were not included. (The period of fertilizer application at Dworshak Reservoir went from 2007 to July 2010.)

Anabaena is a nitrogen fixer. This means that it fixes nitrogen from the atmosphere. There is a metabolic cost to fixing nitrogen so when nitrogen is available, Anabaena does not have an advantage over non-nitrogen fixing phytoplankton taxa, and most likely has a competitive disadvantage. One of the goals of the nutrient supplementation project was to reduce the abundance of the dominant blue-green taxa within Dworshak Reservoir, Anabaena species. We saw a significant reduction in Anabaena biomass between 2006 (non-fertilized) and 2007 (fertilized) (Figure 41). The biovolume as a percent of the phytoplankton community was less than 4% for the years when nitrogen was being added to the system. In 2011, the Anabaena population returned to levels seen prior to nitrogen addition. The percent of the phytoplankton community biovolume made up of Anabaena is visibly higher in years when nitrogen was not added to the system (2005, 2006, and 2011).

The following comments are taken from the Environmental Protection Agency's (EPA) <u>Response to Comments on the Draft NPDES Permit for</u> <u>the US Army Corps of Engineers Dworshak Reservoir Nutrient</u> <u>Supplementation Pilot Project – Permit Number ID0028444, US EPA</u> <u>Region 10, August 2011 – Response # 1, page 2.</u> The Corps concurs with EPA's response.

"After 2007, the Corps has added exclusively nitrogen fertilizer to Dworshak Reservoir, and the permit only allows the discharge of nitrogen fertilizer (see the permit at Page 5). The addition of nitrogen fertilizer to the reservoir, without addition of phosphorus, would tend to increase the mass ratio of total nitrogen to total phosphorus in the reservoir. <u>As stated in the fact sheet (Page 11), increased nitrogen-tophosphorus ratios should discourage the growth of blue-green algae</u> (See also Schindler 1977, Stockner and Shortreed 1988, Smith 1983, and Graham et al. 2004)."

"Furthermore, blooms of blue-green algae, with densities of Anabaena sp. as high as 56,964,672 NCU/ml, far exceeding World Health Organization thresholds, were observed in Dworshak Reservoir near the Visitor Center and near Bruce's Eddy in August 2011, more than one year after nutrient supplementation ceased (IDEQ 2011, personal communication with Andy Dux, Idaho Department of Fish and Game, August 22, 2011, personal communication with Paul Pence, USACOE, August 24, 2011). This demonstrates that blue-green algae blooms can and do occur in Dworshak Reservoir even when nutrient supplementation is not occurring, and suggests that the nutrient supplementation is not the cause of such blooms."

It should also be noted that in its NPDES Permit issued to the Corps, EPA addressed the health risks associated with blue-green algae, including microcystis species. The permit requires routine ambient monitoring for blue-green algae, as well as additional monitoring and notification requirements that are triggered in the event that blue-green algae blooms are observed, or if toxigenic cyanobacteria or the toxins they produce are measured above certain thresholds in the receiving water. The notification thresholds are based on World Health Organization guidelines as well as the draft <u>Blue-Green Algae Response</u> <u>Plan</u> prepared by the Coeur d'Alene Regional Office of the Idaho Department of Environmental Quality (IDEQ 2008)."

In the March 9, 2012 edition of the Columbia Basin Bulletin, Mr. Ed Schriever, Chief of Fisheries, Idaho Department of Fish and Game offers further clarification on the status of blue-green algae blooms within Dworshak Reservoir. In responding to earlier comments on the nutrient supplementation project, Mr. Schriever notes that one individual "... cites the frequency of blue-green algae blooms in recent years and disputes our assertion that blue-green blooms are not caused by nutrient supplementation. While blue-green algae continued to persist in Dworshak Reservoir during periods when it was treated, we are confident that the project did not cause the observed blooms. For one, blooms of toxic blue-green algae were observed in seven out of eight years for which we have pre-treatment sample data."..."Further, neither the percent composition nor amount of toxic blue-green algae observed in samples taken during the project were ever higher than values reported from pre-treatment sample data, and in many cases were lower. Finally, blue-green blooms observed during the treatment period were observed in untreated arms (experimental controls areas) of the reservoir as well as treated areas."

<u>Comment # 6</u> (Drinking water concerns)

"I am very concerned about our water quality since this experiment started."..."And our town of Ahsahka, ID. gets their drinking water from the Reservoir."

"The ACOE Fact Sheet states that drinking water is not affected by the Nutrient Enhancement Program, yet the City of Ahsahka draws its water from the Dworshak Reservoir. As I understand it, the neurotoxin cannot be filtered from the water or, at least, the water treatment methods available to Ahsahka cannot eliminate it."

RESPONSE # 6: The following comments are taken from the Environmental Protection Agency's (EPA) <u>Response to Comments on the</u> <u>Draft NPDES Permit for the US Army Corps of Engineers Dworshak</u> <u>Reservoir Nutrient Supplementation Pilot Project – Permit Number</u> <u>ID0028444, US EPA Region 10, August 2011 – Response # 4, page 5.</u> The Corps concurs with EPA's comments on Idaho Water Quality Standards (WQS).

"Section 200.02 of the Idaho WQS (IDAPA 58.01.02.200.02) states, in relevant part, "surface waters of the state shall be free from toxic substances in concentrations that impair designated beneficial uses." The permittee discharges nitrogen fertilizer. The nitrogen in the fertilizer is present as urea, ammonia, and nitrates. Nitrates and ammonia can be directly toxic to humans and to aquatic life at high concentrations. However, as explained in the Fact Sheet (Page B-7 – B-8), due to the extent to which the fertilizer will be diluted by the receiving water, the discharge will not result in violations of Idaho's water quality criteria for ammonia, nor will it result in violations of EPA's recommended water quality criterion for nitrate in drinking water, which is 10 mg/L (EPA 1986)."

"With respect to the potential toxic effects of blue-green algae, as explained in the fact sheet (Page 11) and in the response to comment #1, above, EPA has no evidence to show that the project is the principle cause of the blue-green algae blooms that have been observed in Dworshak Reservoir, and, other factors being equal, increasing the nitrogen concentration of a waterbody will discourage the growth of blue-green algae."

<u>Comment # 7</u> (Nutrient Supplementation impact on the Dworshak National Fish Hatchery)

"It is most likely the cause of "ills" the little fish got at the hatchery."

"In looking at the Dworshak Reservoir nutrient enhancement project and any impacts it might have on the steelhead program, there were several pieces of subjective evidence noted. First of all, the hatchery noted excessive algae growth in the ponds immediately after the initiation of the project (2007). This observation was uniformly held by all hatchery staff. Casual conversation with staff at Clearwater Hatchery supports this observation as they have also noted increased algae growth in their raceways. This increased algae growth is a strong indicator that a change in water quality has occurred, which is contrary to what is presented in the Fact Sheet and project reports. Second, they noted more frequent gill irritation in steelhead. Katy Clemens, Idaho Fish Health Lab Supervisor (now retired), stated that "...the nutrient enhancement project has resulted in more algae in the water supply, which gets in the ponds. It gets in the gills of the fish and causes an irritation, which can make them more susceptible to pathogens." (Lewiston Tribune Article, "Disease take toll", March 4, 2010). Third, we have experienced random fungal outbreaks in juvenile fall Chinook reared at the hatchery for the transportation and smolt migration research project. These outbreaks were never observed prior to the initiation of the nutrient enhancement program."

"As stated earlier, we have experienced a dramatic spike in IHN related mortalities since the enhancement program began. There is no hard data to demonstrate that nutrient enhancement has had a direct influence on these observations. However, it is certainly feasible, and strongly suspected that it is has resulted in another stressor that collectively with other stressors, has increased the susceptibility of Dworshak Hatchery steelhead to IHN."

"It appears that the Corps has never understood the issue regarding increased IHN mortalities at Dworshak National Fish Hatcheries. As outlined in my comments to EPA, the Fish Health Lab Director at the hatchery noted an increase in steelhead gill irritation coinciding with fertilizer application. Upon close examination, she noted there were small pieces of filamentous algae associated with irritated areas of gill tissue. Gill irritation is a source of stress. Stress increases susceptibility to disease. It really is that simple."

RESPONSE # 7: The following comments are taken from the Environmental Protection Agency's (EPA) <u>Response to Comments on the</u> <u>Draft NPDES Permit for the US Army Corps of Engineers Dworshak</u> <u>Reservoir Nutrient Supplementation Pilot Project – Permit Number</u> <u>ID0028444, US EPA Region 10, August 2011 – Response #3, pages 3 and</u> <u>4.</u> The Corps concurs with EPA's response.

"EPA does not agree with the commenter that there is any causal link between nutrient supplementation in Dworshak Reservoir and IHN mortality in juvenile steelhead at the Dworshak National Fish Hatchery (DNFH). The IHN virus is spread through the urine, feces, sexual fluids, and external mucus of infected fish. Thus, the subject activity could not directly contribute to the spread of IHN.

Furthermore, EPA disagrees with the commenter that the project is contributing to stress upon hatchery fish. As explained in the response to comment #4, below, the nutrient supplementation project has not increased phosphorus or nitrogen concentrations in Dworshak Reservoir or the North Fork Clearwater River (NFCR). Phosphorus, nitrogen, and chlorophyll a concentrations in the NFCR are less than EPA-recommended water quality criteria (EPA 2000). As such, nutrient supplementation is not contributing to excessive algae growth in the reservoir, the NFCR, or in fish hatcheries that obtain water from these sources.

Data provided by IDFG show that, in 2010, concentrations of total phosphorus (TP) and total dissolved phosphorus (TDP) in the DNFH steelhead ponds were much higher than in the North Fork Clearwater River or in Dworshak Reservoir, as measured at station RK-2. The data are summarized in Table1 and Figure 1 below. <u>This suggests that</u> <u>any elevated nutrient concentrations and resulting excess algae growth</u> <u>within DNFH is likely due to internal sources of nutrients at DNFH (e.g.</u> <u>fish food and waste)</u>, as opposed to the nutrient supplementation <u>project</u>. There is no evidence to show that the nutrient supplementation <u>program is the cause of fungal outbreaks in hatchery fish.</u>"

Table 1: TP and TDP Concentrations at Dworshak Reservoir Station RK-2, NFCR, and DNFH Steelhead Ponds				
Parameter, statistic, and units	Reservoir Station RK-2 Epilimnion	Reservoir Station RK-2 Hypolimnion	NFCR	DNFH Steelhead Ponds
TP, méan, μg/L	5	3	10	33
TDP, mean, µg/L	2	3	3	14
TP, median, μg/L	3	1	5	24
TDP, median, µg/L	1	1	1	17

Figure 1: TP and TDP Concentrations at Dworshak Reservoir Station RK-2, NFCR, and DNFH Steelhead Ponds.



In addition to EPA's comments, it should also be noted that the Clearwater Fish Hatchery (located across the North Fork Clearwater River from the Dworshak National Fish Hatchery (DNFH)), gets the majority of its water directly from Dworshak Reservoir. The Clearwater Fish Hatchery has been in operation for 20 years and during this time has experienced little of the IHN or other problems which occur at DNFH. From 2007-2010 when the initial nutrient supplementation project was being undertaken, the Clearwater Fish Hatchery experienced no problems which could be attributed to reservoir fertilization.

Comment # 8

"The results of the USACE 4 year experiment as presented to us by both the USACE and Idaho Fish and game show no improvement."

"The response of kokanee as indicated on page 13 is a statistically insignificant change in size and weight.

RESPONSE # 8: The following information was taken from the Environmental Protection Agency's (EPA) <u>Response to Comments on the</u> <u>Draft NPDES Permit for the US Army Corps of Engineers Dworshak</u> <u>Reservoir Nutrient Supplementation Pilot Project – Permit Number</u> <u>ID0028444, US EPA Region 10, August 2011 – Response #7, page 12.</u> The Corps concurs with EPA's response.

There was an increase in the biomass (i.e. total mass or weight) of the Kokanee present in Dworshak Reservoir in 2010 relative to prior years, including both treatment and non-treatment years (personal communication with Andy Dux, IDFG, May 27, 2011).

The following information is from the <u>Idaho Fish and Game Nutrient</u> <u>Supplementation Project Update, April 2012</u>.

... to compare the size of kokanee in years when their numbers were similar, one with fertilizer and one without. There are two pairs of years we can use for this. The years 2004 and 2008 are years of low fish numbers, but we fertilized in 2008 and not in 2004. In 2008, the average length of a two year old kokanee was the same as in 2004, but the fish in 2008 weighed more. The years 2006 and 2010 had high numbers of fish, but we fertilized in 2010 but not 2006. In 2010, the average adult fish was about an inch longer than in 2006 and weighed 50% more. The biomass, or total weight of all the kokanee in the reservoir, was also 50% more in 2010 than in 2006, even though we estimated slightly more fish in 2006. While these fish were smaller than they would be in a year with fewer fish, they were much longer and heavier than we saw prior to fertilization. This indicates that the nutrient program is resulting in better kokanee growth.

It is important to understand that it takes a few years for fertilization to benefit higher levels of the food chain, such as kokanee. <u>We were just</u> <u>starting to see what looked like a very positive response from kokanee to</u> <u>the fertilization project when we had to stop adding nutrients. So, we</u> <u>still need more information to fully understand the effects that</u> <u>fertilization has on kokanee...</u>



Biomass of kokanee increased substantially during the fourth year of fertilization (2010). In 2006, there was no fertilization and fish density was similar, but kokanee size was greater following fertilization and resulted in almost twice the biomass in 2010.

Comment # 9

"..., there have been several attempts at marketing this project by making false claims about the project benefits. The most recent was in the Columbia Basin Bulletin, where Dworshak's Resource Manager tried to link the 2 state record smallmouth bass to nutrient enhancement, when in reality, they were both caught before the project began. The aforementioned state record fish were caught in 1995 and 2006, respectively..."

RESPONSE # 9: The Corps disagrees with this comment. The Resource Manager is thoroughly familiar with the years in which state record smallmouth bass were caught at Dworshak Reservoir and made no deliberate attempt to link the nutrient supplementation project to producing two state record smallmouth bass. The referenced article was posted in the January 20, 2012 edition of the Columbia Basin Bulletin. The Corps sees the Resource Manager's comments as nothing more than a basic statement of fact noting that Dworshak Reservoir has twice produced state record smallmouth bass.

Comment # 10

"...I request not only an extension but a Public Hearing in Clearwater County, as set forth in the NEPA regs."

RESPONSE #10: The National Environmental Policy Act (NEPA), the Council on Environmental Quality NEPA Regulations (i.e. 40 Code of Federal Regulations 1500) and the Corps of Engineers' procedures for implementing NEPA (i.e. Engineering Regulation 200-202), do not require that a public hearing be held for the preparation of an environmental assessment.

<u>Comment # 11</u>

"It has come to my attention that your project (Dworshak Nutrient Enhancement Program) under which the EPA permit was issued is now advertised (in the local paper) as the Dworshak Reservoir Ecosystem Restoration Program, I'm concerned that changes have been made of which the folks of my county have not been made aware of."

RESPONSE # 11: As noted in the project EA, the proposed 2012-2016 Dworshak nutrient supplementation study will be the same as the one conducted on Dworshak Reservoir from 2007 – 2010. There are no changes between the initial pilot study and the currently proposed undertaking. Since the initial study only ran for approximately 3.5 years, the goal of the current study is to complete a full 5 years of nutrient supplementation on Dworshak Reservoir to acquire more complete data to assess the effectiveness of the liquid fertilizer nutrient supplementation approach. It is believed that both Orofino and Clearwater County residents are already familiar with the proposed project undertaking because of previous meetings and discussions held with regard to the initial 2007 Dworshak Reservoir Nutrient Supplementation Pilot study.

Comment # 12

"And where you have "Coordination", you did not coordinate with the people or the board of Clearwater Commissioners on this, only the City of Orofino."

RESPONSE # 12: The identified "Coordination" refers to a listing of entities directly sent a copy of the project EA and draft FONSI for review and comment. The omission of the Clearwater County Board of Commissioners was an oversight when the initial list was prepared. This was rectified during the 30 day extension on the comment period when a copy of the project EA and draft FONSI were provided to the Clearwater County Courthouse. The Corps did coordinate with Clearwater County residents regarding proposed project activities – e.g. public comment periods on project EA and draft FONSI (January 18 to February 16, 2012 and February 17 to March 17, 2012), newspaper notices in the Clearwater Tribune (January 18, 2012; February 22, 2012; March 7, 2012) and project information on the Corps' internet website – January 18, 2012 to present)).

Comment # 13

"Your "FONSI" is a joke, it ignores or violates every rule in the Fed's policy acts handbook."

RESPONSE # 13: The Corps disagrees. A FONSI is a decision document intended to explain why a proposed action does not have a significant impact on the human environment and therefore, does not require the preparation of an Environmental Impact Statement (EIS). The Dworshak Reservoir Nutrient Supplementation Study draft FONSI sent out for public review documented the nature of the proposed project and provided the rationale for the Corps' decision that the proposed action will not have a significant impact on the human environment. Without further information/clarification, we are not aware of what specific "Fed's policy acts handbook" the FONSI violates.

Comment # 14

"The Environmental Assessment states: If liquid fertilizer is determined to be an ineffective supplement, other potential supplementation processes may be considered/used for a future nutrient application pilot study."..."To me, this implies that ACOE, by making this statement, could at its sole option, bypass the NPDES process which permits the use of Nitrogen in any form it chooses. "..."So, a change from one form of enhancement to another by ACOE could be expected, but it should be accompanied by appropriated permitting and public input."

RESPONSE # 14: The intent of the EA statement was only to clarify that should the current nutrient supplementation effort not work and should the Corps decide at a future date to undertake another type of nutrient supplementation project, it would also be done under the same NEPA process that is being conducted for the currently proposed supplementation action. The Corps would not make the decision unilaterally or without first notifying the public and seeking public comment on the proposed action. There would be no effort to move forward secretively or in a vacuum.

Comment # 15

"The fact sheet, NPDES permit, and the Environmental Assessment do not address full engagement with the public on Nutrient Enhancement."

"ACOE and IDFG have pushed enhancement to the exclusion of the public. Its secretiveness and misinformation campaign have contributed much to the atmosphere of distrust. More openness and public involvement THROUGHOUT the enhancement period would be welcome."

RESPONSE # 15: The Corps has coordinated with the public and other Agencies throughout this project as evidenced by the below timeline of pertinent activities.

May 13, 2003 – Big Eddy Marina Development Workgroup (BEMDW) discusses nutrient enhancement

May 27, 2003 – Results of BEMDW presented to Clearwater County Commission

July 9, 2003 – Orofino Diversity Development Group publicly announces results of BEMDW via news release

May 17, 2004 – Corps and Idaho Fish and Game discuss feasibility of nutrient enhancement

Oct. 20, 2004 – Nutrient Enhancement Pilot public meeting in Lewiston, Idaho

Dec. 16, 2004 – Feasibility discussed by Corps, IDFG and Idaho U.S.

Senate and U.S. House delegation staff (Crapo, Craig, Otter) at

Dworshak Large Boat Marina Meeting; Idaho Rural Economic

Development, Clearwater County Economic Development, Idaho Park Parks and Recreation also attended

Feb. 2006 – Feasibility report about rationale of nutrient

supplementation at Dworshak Reservoir completed

May 2006 – Corp begins discussion with U.S. Environmental Protection Agency (EPA) about National Pollutant Discharge Elimination System (NPDES) permit

Aug. 2006 – Corps completes Endangered Species Act (ESA) Biological Assessment (BA)

Aug. 15, 2006 – Public meeting in Orofino, Idaho

Aug. 16, 2006 – Public meeting in Lewiston, Idaho

Sept. 2006 – U.S. Fish & Wildlife Service (USFWS) provides concurrence for pilot study under ESA

Sept. 2006 – IDFG publishes Dworshak Kokanee Population and Reservoir Productivity Assessment (IDFG Report Number 06-35); includes 2004/2005 field season studies Dec. 2006 – National Marine Fisheries Service (NMFS) concurs with pilot study under ESA

April 2007 - Corps submits NPDES permit application to U.S.

Environmental Protection Agency (EPA); EPA did not require NPDES permit at this time

April 2007 – Idaho Department of Environmental Quality (IDEQ) issues First Consent Order to IDFG

May 7, 2007 – Corps signs Categorical Exclusion under National Environmental Policy Act (NEPA) for pilot study

May 10, 2007 – Corps and IDFG sign memorandum of understanding as partners in pilot study

Feb. 2008 - IDEQ issues Second Consent Order

Feb. 2009 – IDEQ issues Third Consent Order

April 2010 – IDEQ issues Fourth Consent Order

June 29, 2010 – Pilot study public meeting at Orofino High School July 2010 – EPA determines NPDES permit is required; Corps & IDFG voluntarily pauses nutrient supplementation project to resolve permit issue

Jan. 14, 2011 – Corps submits additional NPDES permit information to EPA

Feb. 11, 2011 – IDEQ sends 401 certification to EPA

March 23, 2011 – EPA proposes to issue NPDES permit; provides Fact Sheet; asks for public comments

May 23, 2011 – IDFG and Corps project updates to Clearwater County Commission followed by public meeting at Orofino, Idaho

May 24, 2011 - EPA public comment period ends (originally scheduled to end April 22)

May 25, 2011 – EPA issues Biological Assessment for pilot study June 6, 2011 – EPA issues final NPDES permit

Aug. 19, 2011 – IDEQ issues blue-green algae bloom news release

Oct. 15, 2011 - EPA NPDES permit goes into effect

Jan. 18, 2012 – Corps releases draft Environmental Assessment, Finding of No Significant Impact (FONSI). Comment period to close Feb. 16 Feb. 16, 2012 – Corps extends EA/FONSI public comment period to March 17

April 12, 2012 – Public open house in Orofino, Idaho, to explain planned 2012 operations

Comment # 16

"The Environmental Assessment assumes that the treatments will continue for five years. There should be interim decision points in the five year period when go/no-go decisions are made while also considering public input. Otherwise, there is an assumption that regardless of the results of the treatment that enhancement will continue."

RESPONSE # 16: The 5-year period identified for the nutrient supplementation study is seen as a minimum time within which a reliable set of data can be gathered and used to assess the feasibility of continuing with this particular process. The initial reservoir supplementation pilot study that began in 2007 lasted approximately 3.5 years before it was stopped. The data generated up to that point was reviewed and determined to be inconclusive with regard to providing a level of sufficiency needed to establish program effectiveness. The inconclusiveness of this data supports the objective of having a 5-year study in order to gather a sufficient level of data. If at the end of the 5year study the data doesn't support liquid fertilizer as a viable nutrient supplementation process for the reservoir or is inconclusive on results, this particular approach to reservoir nutrient enhancement will be discontinued.

Comment # 17

"The EA suggests that the dilution factor for the applied fertilizer equates to about 1 teaspoon of fertilizer in 39,000 gallons of water. Again, that's not completely true. That value is apparently based on full reservoir capacity (93 billion gallons), and not just the eplimnion. Further, the Corps has claimed that nutrient uptake by the biota occurs very quickly, and if that is true, then complete mixing of the applied fertilizer is not possible. Best case scenario is that during application, there is a "ribbon" of much higher nitrate concentrations than the Corps leads the public to believe. There is no way that the applied fertilizer could mix completely in the eplimnion, even if it took 12 hours for uptake by the biota as stated on page 7.

RESPONSE # 17: The epilimnion depth is normally used to calculate the amount of dilution. A 9-meter depth is used to calculate volume

when there is no epilimnion or thermocline established. The volume will vary with reservoir elevation as the surface are of the reservoir will decrease with pool elevation. The entire reservoir has approximately 766 billion gallons in it. The 93 billion gallons is the approximate volume of the epilimnion.

It is true that complete mixing from the dissolved form of the nitrogen doesn't occur evenly throughout the reservoir epilimnion since the nitrogen is taken up by the phytoplankton. In another sense the nitrogen is mixed in with the entire reservoir due to uptake and subsequent release of nutrients through cell death, the consumption of the phytoplankton by zoolplankton, and consumption of zoolplankton by kokanee and other higher organisms. The end result over time is that the nitrogen is distributed throughout the entire life zone of the reservoir.

Epilimnion volume or the volume contained within 9 meters of the reservoir surface will continue to be used to determine the degree of dilution as this methodology is included in the NPDES permit reporting requirements.

Comment # 18

"The Corps is now trying to label this project as "Ecosystem Restoration". Nothing could be farther from the truth. This project is attempting to mimic an artificially inflated level of aquatic production that occurs "temporarily" in virtually every new reservoir or enhance lake."

RESPONSE # 18: The Corps agrees that the nutrient supplementation project is not an "Ecosystem Restoration" undertaking. If such terminology was used in the past, it was incorrect. The currently proposed action is an effort to supplement/enhance, not to restore.