**From:** Ross Barkhurst
**To:** Rockett, Derek (ECY)
**Subject:** Comments on DEIS/NPDES for carbaryl/imidacloprid
**Date:** Sunday, December 07, 2014 8:15:11 PM

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I am writing to comment on the subject. In a previous submittal DOE has questioned my scientific qualifications so I will start with a brief review of them.

I am a graduate of the US Naval Academy with a BS in Naval Science. While there I earned the opportunity to take overload courses for a second major in Oceanography. I completed these studies also. They included biology, geology, Environmental Dynamics, and Littoral Processes among many others. Hydrodynamics were included in these and other courses. They included field work in Chesapeake Bay, a vertical boundary estuary, with professors and staff from the Naval Oceanographic Office. The Naval Science curriculum was heavy in science, math, and engineering requirements in addition to Oceanography. More details can be found in previous DOE submittals.

Following graduation and six years service in the nuclear submarine force, I possessed a good understanding of tides, currents and waves in oceans and estuaries. Next came 30 years of employment as a civilian in the nuclear power industry. This involved jobs at all levels of supervision from system engineer up to and including President and CEO of a generating company that owned and operated a nuclear power plant. These jobs included direct responsibility for operation, maintenance, and management of pollution control equipment under three different NPDES and EIS permits, at three different plants. For much of this period I was personally the signatory holder of such permits. I participated in the submittal and modification of these permits. They included extensive environmental monitoring programs and reporting requirements. Biological and chemical sampling were involved, as were meteorological towers and atmospheric data they collected. Further information on this and my 35 years experience with Willapa Bay, along with sampling I have done here, can be found in extensive previous submittals before DOE.

I do not mind being treated like any other ordinary citizen in these proceedings. I do mind the way we citizens and our input our treated. This is one of several reasons why subject documents are unacceptable. Just like the Corvair, the framework alone makes them "unsafe at any speed". We are not adequately informed ahead of time, and our input is not valued. On Dec 2 there were only three copies present at the open house. I was told I could not have a copy of any to review before the testimony on them.The public could not hear much of the testimony. We were told it was not important to hear it, it was just for DOE! If we wanted to know what was said we could get copies of transcipts some day later and read them. This was not practical if possible before a Dec 8 deadline. When we asked how

the Chum and Chinook runs were doing we were told "I do not know" by the permit author and Water Quality Manager.
The next reason the subject is not ready for issuance in any form is the nature of gathering of public input along with misleading information put out in preliminary workshops.
Folks were told, in the case of imazamox on japonica, that there would be acreage limits and buffer zones between it and protected vegetation. This never happened. This time we are told there will be spray exclusion zones, at least until more testing is done. Then the permit can be expanded. So we do not have the picture. Any trusting member of the public may be satisfied at some point. If he does not attend every meeting for three years, and then reviews the final product, he may be surprised to see things missing. He will see spray where it was not proposed. If he does attend, he will see no justification for the lack of analysis. He will see the no monitoring no baseline no acceptance criteria document that emanated. If he comments, he will be treated as unqualified. People have asked me, if you are not qualified, how could any other public input be considered? Well it seems that it would not. I mention imazamox because it is the template for the subject failed approach, affects many of the same waters, plants or animals it proposes to pollute, and would have cumulative effects with carbaryl/imidacloprid. These cumulative effects are not evaluated. One must assume that DOE has decided that there are no cumulative effects, or there is no need to look for them, or in its role as just a "clearinghouse" for other agencies, no agency has provided any material, so DOE has carried out its job. So we have no integrator of all this input if it is ever received. This could not meet any requirement for due diligence. It openly demonstrates the opposite. Without an integrator, we have no answer and it would be arbitrary and capricious to go forward. The obvious shortcoming here is that DOE is issuing this permit and now wants the public to believe that ask, see and hear no evil is enough. We do not. My experience, background, and common sense tells me that all avenues must be explored, and I see no evidence that they have. During the Dec 2 meeting we were told that no meaningful input was received from WDFW, for example. Likely "they would submit something by Dec 8". Even if we accept this approach, which we should not, it means that the public has been showed incomplete staff work. We could not integrate that which is not there. We are being shown what the permit would look like without WDFW or DNR input on public tidelands or habitat.We are being showed a DEIS as it would look without WDFW or DNR habitat input on six species of fish and waterfowl that seldom or never meet management goals, by a department named "Ecology". Even if any of this shows up, we cannot review it before our comment period has expired! It would be arbitrary and capricious to issue a permit under such conditions.
The lack of quality control over input and evaluations has produced some wide gaps in ecological reviews. In the Dec 2 meeting neither the permit writer nor the region Water Quality Program Manager could answer a simple question about status of Chum or Chinook runs in Willapa Bay. The answer to a question about status was " I do not know". While seeming to validate that DOE is acting merely as a clearinghouse, it also validates the problem of incomplete science informing this permit and the ability of the public to review

results. We are led to believe the results are not in, the permit may change, so not to worry. The above salmon runs are actually in trouble having met escapement goals approximately one out of nine and one out of ten years respectively. As a member of the Ad Hoc Committee to advise WDFW on a new policy for salmon management in the Willapa Drainage, a scientist, fisherman, and conservationist, I am painfully aware of these problems and millions of dollars of economic loss likely to fall on Pacific County during restoration. Such restoration could take up to 25 years for Chinook. Such restoration of natural origin recruits (NORs) is a requirement in our state. Due diligence, even by a clearinghouse, would reveal this fact. Two or three permits in a two year period designed to remove unquantified cover and forage for salmon would need detailed analysis, baselines, and monitoring to ensure carrying capacity is adequate for such resources. One chemical, carbaryl, is already unapproved by EPA around salmonid smolts. We are asked to review a DEIS for this, now. Again, though it is hard to imagine such a twist, if new approval occurred we know one thing. The public will have no more review or input on any conditions here than it did earlier this year when imidacloprid was authorized without the promised permit review for over 500 acres. We were told last Dec that imidacloprid would only be applied in our bay after public review. It was applied with no review.

The third problem, again disqualifying of the DEIS/NPDES by itsself, is the poor quality of technical input on display. We have been beset by waterfowl "risk" assessments from the WSU Ag extension office in Pacific County for years. All have been disproved. The latest is called a forage budget and has been shown to be low by several orders of magnitude. This means waterfowl can consume many times the available eelgrass in Willapa Bay and must move on. It now matches with empirical data from Willapa Bay and Boundary Bay which has already shown this to be the case. DOE has extensive submittals from me, Washington Waterfowl Association, and others on this matter, and has ignored it in subject DEIS and another. It must be taken into account for this permit alone and together with the imazamox on eelgrass permit for cumulative effects. If our clearinghouse was waiting for input to this effect, I am now providing such input. As with some previous remarks here, this is the poster child for overlooked net loss of ecological function, cleared by a department named Ecology. In addition to specific types of eelgrass, waterfowl consume invertebrates. These are especially critical for females to accumulate protein in order to rear a brood successfully after arriving in the north. For some this is the north. After allowing removal of unlimited acres of zostera japonica and zostera marina associated with japonica on treated beds with imazamox, we now see a draft permit to remove invertebrates which may have survived without eelgrass. We need to see cumulative effects. Perhaps this will be in the late shipment of information arriving at the clearinfhouse after public review of drafts lacking it. Again, this would be too late for required meaningful public review, and not diligent.

This problem is also illustrated by technical input contrary to studies and BIOPS referenced. A few examples are hopefully instructive. BIOP BO NWP 48 April 28, 2009, " Carbaryl application is also likely to adversely affect water quality and sediment quality. While the

area of application is quite limited relative to both the number of farmed acres and total acres in each estuary, carbaryl can persisit -----for several hours (in the water column) and weeks (in the sediment) after application, and drift hundreds of feet from application sites. Carbaryl has been detcted in water samples as many as sixty days after spraying. Therefore, carbaryl in Willapa Bay and Grays Harbor will bear on the functional condition of water and sediment quality PCEs, adversely affecting proposed CH in the area."
Subject DEIS does not address this adequately. It is still the case. Perhaps the statement on imidacloprid is felt to cover this too. "Imidacloprid would be unlikely to adversely affect salmonids or their critical habitat because salmon only travel through the nearshore habitat during out migration". This is incredible. Smolts of various species occupy the estuary for months and longer. See the Wild Fish Conservancy study for 2012 for smolt habitat in Grays Harbor (previously provided in earlier submittals). Almost all of the pre ocean life of chum smolts is spent in the estuary, largely in eelgrass. The DEIS statement contains three misleading words in one sentence--only, nearshore, and outmigration. Eelgrass beds and oyster beds occur in the middle of the bays and nearshore. No provision is made in DEIS for connectivity between stream mouths and channels. Clam beds can be sprayed under this permit, although complaints in hearings have been about shrimp in oyster beds. Smolts of problem species are treated like nearshore transients whereas they are highly attracted to eelgrass beds of both species and are resident for various periods of time. 45,000 acres of Willapa Bay, much nearshore, do not even have water over them much of the time. Food and cover connectivity to outer channels are the key to survival for many months. This is spelled out in detail in the above study, which I have referred to DOE on more than one occasion. In the Dec 2 meeting in South Bend, we were shown some exclusion zones for spraying. Much of the south Willapa Bay and some near Cedar River in the north were delineated. Sediment pollution was a cause given. Total Organic Carbon and failures of tests on invertebrate loss were given as contributers. Growers were assured that tests would be continued with the goal of freeing up these areas. The systemic imidaloprid is held, in the water, in and on sediment, by detritus. This will not change. Operators at Three Mile Island found out the consequences of repeating a test until a desired result is seen. "Believe your indication" is better guidance in this situation. The southern no spray zone in Willapa Bay is drawn to allow spraying at the mouth of three forks of the Nemah River and in the North and South Nemah channels. It is drawn to allow spraying in the northern portion of the Naselle estuary and Stanley Channel. These areas are inhabited by three species of salmon smolts.Two of these no longer meet escapement! There are several old shellfish beds in the Nemah area which have been purchased for habitat values and for the public by WDFW. Old maps show private owners, newer ones show "WDFW". They are excellent waterfowl,salmon smolt, and shorebird habitat. These are the types of areas purchased with WA Duck Stamp money for waterfowl and those who appreciate them. I can find no justification for including them in zones for vegetation and invertebrate removal. I have personnally sampled hundreds of waterfowl exiting these areas after feeding in them. Depending on the species and tide, they have consistently contained seeds of Lyngby's Sedge, Zostera japonica leaves,

other salt marsh seeds, and a slurry of invertebrate "goop". These areas were well chosen by WDFW and conservancy groups for protection. Now they can be defoliated and the inverts removed. Why? With no meaningful WDFW input, I still ask why? I understand from the sediment person from DOE present at the Dec 2 meeting that TOC is indicated less in silty substrate and much more in black mucky substrate. It is my understanding that this indicates oxygen starved decomposition of organic matter. There is plenty of this in the Nemah Flats I have described here. Some is the remains of tons of spartina root masses still present. In upper areas there is still living spartina. This is not going away soon. More carbon will arrive from eelgrass spraying approved earlier this year. Much of this is a low circulation zone as documented below.These areas meet the same criteria as those excluded from spraying. If a value judgement has been analyzed to remove X amount of waterfowl, shorebird, and smolt habitat, the public has not seen it. The writer and Water Quality Manager do not know there is a salmon problem, but are proposing to add to it! It is unlikely that such an analysis could pass a review with the current state of six affected species. These are Chum salmon, Chinook salmon, Green and White sturgeon, Northern Pintail, and Pacific Brant. It will not be justified or reviewed by the public in the next two days.

In previous submittals to DOE I have described the initial conditions for vertical and horizontal boundary estuaries, and shown that Willapa Bay meets these in every respect. Grays Harbor should be reviewed for this also. I have demonstrated a problem caused by the net inflow of seawater through the west portion of Willapa and net outflow on the east. I have related the problem caused by the low circulation area this sets up in the south portion and the accumulation of pollutants and detritus that can and has resulted. The chart showed in the Dec 2 meeting (2005 Banas and Hickey) "dispersion gap" shows dwell times of water over forty days in the south bay. This surely already has caused problems following eight years of spartina removal. DOE TOC concerns are valid. Massive spartina spraying is hopefully over. Some continues. The eelgrass and now shrimp and invertebrate removal has the nature of ongoing work. It gives growers a permanent competitive advantage that would be exploited as long as it pays. This would drive more pollutants into the south Willapa National Wildlife Refuge, now devoid of Zostera marina following spartina spraying. The poster bird for this refuge, the Pacific Brant, is missing here in aerial surveys, due to lack of eelgrass in Winter and during Spring staging. I have seen the results of anoxia in low circulation zones and high TOC in Chesapeake Bay. It turned white from dead fish bellies. I cannot tell you how much was toxic algae bloom due to high organics and how much was from decaying other organic matter. I can tell you I have relayed this to our DOE clearinghouse and it has not been addressed for imazamox nor in this DEIS, which will contribute more in unquantified amounts. Carbon and imidacloprid would be carried into a low circulation zone. Imazamox will kill plants and imidacloprid will ride their detritus into a low circulation zone of over forty days residence time. Five half lives later it would be gone. These conditions are never scheduled to stop for 200 days! As it leaves more will be transported in. In other words it will never leave. I have seen no monitoring for this

year's post imazamox or this year's imidacloprid excursion. I can say it is unacceptable to proceed as far as we have already, let alone to go further at this time. Reducing some spray area area without further analysis and monitoring is not prudent, it is "fire and hope, but do not check". It is "do not spray where the probem is", not the same as "do not spray where the root cause is." Some of these problems fall directly in DOE's wheelhouse. Some cry out for WDFW and or DNR help. The public has seen none of the above.

I have not attempted to cover all of both bays with my analysis. I have a a high degree of professional confidence that I have not "stumbled on" the Nemah Flats, South Bay, or North Bay as the only places where hydrodynamics, chemistry, sediment, population, and other problems can combine, and already have. I do not have the resources or staff to cover all of both bays. DOE has not martialled the resources to do this. DOE appears unwilling, unqualified, or unprepared to integrate it all if it had it. It would be a herculean task. Just the monitoring to implement a now imaginary program meeting all prudent needs would be herculean. The subject always gets to "we will do adaptive management as needed." The current state of many deficient populations in our two bays shows we are not up to this. The state of numerous listed species in Puget Sound shows we are not up to this. The decades long decline of green sturgeon (listed) and white sturgeon alone in Willapa Bay show we are not up to this. This decline has occurred for decades while we sprayed their forage here, with a now unapproved chemical DOE is trying to get reinstated! Our only path forward is to protect and enhance what we have. Just the dearth of state agency input on this DEIS/NPDES shows we would have to work much harder and in closer inter-agency coordination to achieve this lesser goal I have suggested. There are numerous more examples of technical shortcomings, conflicts of interest, and in situ problems I could discuss. I will not attempt to do that here. It is key to note that these are not concerns I am listing. Most are actual problems that already exist, and would grow under proposed permits. Let us not create more and let us make some go away. Should you have any further questions please advise and I would be glad to attempt to assist.

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| **From:** | Ross Barkhurst |
| **To:** | Rockett, Derek (ECY) |
| **Subject:** | NPDES comments |
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I would like to add some comments which are another example of how literature has been cherry-picked to produce a clearly inadequate subject. With green sturgeon listed and white sturgeon at a harvest retention of zero now, they deserve as much or more attention as waterfowl and salmon.

The DEIS sections discussing sturgeon are misleading and place these fish at further risk. DEIS claims " carbaryl could affect large vertebrates such as green sturgeon-----only if applied in direct contact (NMFS 2009)". However NMFS BO for NWP 48, April 28, 2009 says" USFWS 2008 found that certain sturgeon species( Atlantic sturgeon, shortnose sturgeon) have been shown to be very sensitive to chemical exposures relative to other fish species. If so then the southern DPS of green sturgeon are likely to exhibit similar, if not greater, behavioral effects as experienced by juvenile salmon." I would ask what about imidacloprid? As a great unknown in some respects, but a known with respect to contamination of bottom sediments providing most sturgeon forage, this has not been shown to be safe for them. They are on the brink and we have no consideration here for their restoration or protection. WDFW is again AWOL.

This indicates another unresolved problem. It is another fatal flaw produced by the flawed process previously discussed. The process is likely the root cause. The problem is an unuseable DEIS/NPDES. As unuseable, it cannot be issued. The root cause may or may not be fixed. The NPDES cannot be issued.

I have seen no economic analysis that can pass a smell test regarding tradeoffs related to clear and present loss of recreational and commercial fishing, including crabs, in Willapa and Grays Harbor drainages. If one exists please provide and I would critique it.