On October 31, 2011, EPA issued a final NPDES Pesticide General Permit (PGP) for point source discharges from the application of pesticides to waters of the United States. This action was in response to a 2009 decision by the U.S. Sixth Circuit Court of Appeals (National Cotton Council, et al. v. EPA) in which the court vacated EPA's 2006 Final Rule on Aquatic Pesticides and found that point source discharges of biological pesticides, and chemical pesticides that leave a residue, into waters of the U.S. were pollutants under the Clean Water Act (CWA). As a result of the court's decision, NPDES permits are generally required for these types of discharges as of October 31, 2011.

The EPA's final PGP covers Operators that apply pesticides that result in discharges from the following use patterns: (1) mosquito and other flying insect pest control; (2) weed and algae control; (3) animal pest control; and (4) forest canopy pest control. The permit requires permittees to minimize pesticide discharges through the use of pest management measures and monitor for and report any adverse incidents. Some permittees are also required to submit NOIs prior to beginning to discharge and implement integrated pest management (IPM)-like practices. Record-keeping and reporting requirements will provide valuable information to EPA and the public regarding where, when, and how much pesticides are being discharged to waters of the U.S. Pesticide application use patterns not covered by EPA's Pesticide General Permit may need to obtain coverage under an individual permit or alternative general permit if they result in point source discharges to waters of the U.S.

Tennessee Department of Environment and Conservation, Division of Water Resources adopted the EPA's PGP in its entirety. Only substantive changes from the EPA's permit were in regards to pesticide application activities that result in a point source discharge to one or more Waters of the United States containing National Marine Fisheries Service (NMFS) Listed Resources of Concern, as not being applicable to the State of Tennessee. Other, minor modifications with regards to applicable state laws and rules were also included in the proposed state permit. EPA's original rationale is provided verbatim, starting on the following page.

United States Environmental Protection Agency

Final National Pollutant Discharge Elimination System (NPDES) Pesticide General Permit (PGP) for Point Source Discharges to Waters of the United States from the Application of Pesticides

Fact Sheet

Agency: United States Environmental Protection Agency
Action: Notice of Draft NPDES General Permit

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I. Background

1. Clean Water Act

Section 301(a) of the Clean Water Act (CWA) provides that "the discharge of any pollutant by any person shall be unlawful" unless the discharge is in compliance with certain other sections of the Act. 33 U.S.C. 1311(a). The CWA defines "discharge of a pollutant" as "(A) any addition of any pollutant to navigable waters from any point source, (B) any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft." 33 U.S.C. 1362(12). A "point source" is any "discernible, confined and discrete conveyance" but does not include "agricultural stormwater discharges and return flows from irrigated agriculture." 33 U.S.C. 1362(14).

The term "pollutant" includes, among other things, "garbage… chemical wastes, biological materials …and industrial, municipal, and agricultural waste discharged into water."

One way a person may discharge a pollutant without violating the section 301 prohibition is by obtaining authorization to discharge (referred to herein as "coverage") under a section 402 National Pollutant Discharge Elimination System (NPDES) permit (33 U.S.C. 1342). Under section 402(a), EPA may "issue a permit for the discharge of any pollutant, or combination of pollutants, notwithstanding section 1311(a)" upon certain conditions required by the Act.

2. NPDES Permits

An NPDES permit authorizes the discharge of a pollutant or pollutants into a receiving water under certain conditions. The NPDES program relies on two types of permits: individual and general. An individual permit is a permit specifically tailored for an individual discharger or situations that require individual consideration. Upon receiving the appropriate permit application(s), the permitting authority, e.g., the United States Environmental Protection Agency (EPA) or a state, develops a draft permit for public comment for that particular discharger based on the information contained in the permit application (e.g., type of activity, nature of discharge, receiving water quality). Following consideration of public comments, a final permit is then issued to the discharger for a specific time period (not to exceed 5 years) with a provision for reapplying for further permit coverage prior to the expiration date.

In contrast, a general permit covers multiple facilities/sites/activities within a specific category for a specific period of time (not to exceed 5 years). For general permits, EPA or a state develops and issues the permit in advance, with dischargers then generally obtaining coverage under the permit through submission of a Notice of Intent (NOI). A general permit is also subject to public comment prior to issuance. For the case of this general permit, EPA is the permitting authority for the states that have not been authorized by EPA to issue NPDES permits. Each permitting authority should review their permittees and geographic area and develop appropriate permits considering technology and water quality. In addition, states may issue a permit that has different requirements from this EPA permit for similar types of discharges, as long as it satisfies the regulatory requirements of the NPDES program, the CWA, and state law.

Under 40 CFR 122.28, general permits may be written to cover categories of point sources having common elements, such as facilities that involve the same or substantially similar

types of operations, that discharge the same types of wastes, or that are more appropriately regulated by a general permit. Given the significant number of pesticide operations requiring NPDES permit coverage and the discharges common to these operations, EPA believes that it makes administrative sense to issue the general permit, rather than issuing individual permits to each Operator. Courts have approved of the use of general permits. See e.g., *Natural Res. Def. Council v. Costle*, 568 F.2d 1369 (D.C. Cir. 1977); *EDC v. US EPA*, 344 F.3d 832, 853 (9th Cir. 2003). The general permit approach allows EPA to allocate resources in a more efficient manner and to provide more timely coverage and may significantly simplify the permitting process for the majority of pesticide dischargers. As with any permit, the CWA requires the general permit to contain technology-based effluent limitations, as well as any more stringent limits when necessary to meet applicable state water quality standards. State water quality standards apply in the territorial seas, defined in section 502(8) of the CWA as extending three miles from the baseline. *Pacific Legal Foundation v. Costle*, 586 F.2d 650, 655-656 (9th Cir. 1978); *Natural Resources Defense Council, Inc. v. U.S. EPA*, 863 F.2d 1420, 1435 (9th Cir. 1988).

3. History of Pesticide Application Regulation

EPA regulates the sale, distribution and use of pesticides in the United States under the statutory framework of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) to ensure that when used in conformance with FIFRA labeling directions, pesticides will not pose unreasonable risks to human health and the environment. All new pesticides must undergo a registration procedure under FIFRA during which EPA assesses a variety of potential human health and environmental effects associated with use of the product. Under FIFRA, EPA is required to consider the effects of pesticides on the environment by determining, among other things, whether a pesticide "will perform its intended function without unreasonable adverse effects on the environment," and whether "when used in accordance with widespread and commonly recognized practice [the pesticide] will not generally cause unreasonable adverse effects on the environment." 7 U.S.C. 136a(c)(5). In performing this analysis, EPA examines the ingredients of a pesticide, the intended type of application site and directions for use, and supporting scientific studies for human health and environmental effects and exposures. The applicant for registration of the pesticide must provide specific data from tests done according to EPA guidelines.

When EPA approves a pesticide for a particular use, the Agency imposes restrictions through labeling requirements governing such use. The restrictions are intended to ensure that the pesticide serves an intended purpose and avoids unreasonable adverse effects. It is illegal under Section 12(a)(2)(G) of FIFRA to use a registered pesticide in a manner inconsistent with its labeling. States have primary authority under FIFRA to enforce "use" violations, but both the States and EPA have ample authority to prosecute pesticide misuse when it occurs.

4. Court Decisions leading to the CWA regulation concerning Pesticide Applications

Over the past ten years, several courts addressed the question of whether the CWA requires NPDES permits for pesticide applications. These cases resulted in some confusion among the regulated community and other affected citizens about the applicability of the CWA to pesticides applied to Waters of the United States. In 2001, the United States Court of Appeals for the Ninth Circuit held in Headwaters, Inc. v. Talent Irrigation District (Talent) that an applicator of herbicides was required to obtain an NPDES permit under the circumstances before

the court. 243 F.3rd 526 (9th Cir. 2001). The Talent decision caused considerable confusion among public health authorities, natural resource managers, and others who rely on pesticides regarding their potential obligation to obtain an NPDES permit when applying a pesticide consistent with FIFRA.

In 2002, the Ninth Circuit in League of Wilderness Defenders et al. v. Forsgren (Forsgren) held that the application of pesticides to control Douglas Fir Tussock Moths in National Forest lands required an NPDES permit. 309 F.3d 1181 (9th Cir. 2002). The court in Forsgren did not analyze the question of whether the pesticides applied were pollutants, because it assumed that the parties agreed that they were. In fact, the United States expressly reserved its arguments on that issue in its brief to the District Court. Id. at 1184, n.2. The court instead analyzed the question of whether the aerial application of the pesticide constituted a point source discharge, and concluded that it did. Id. at 1185.

Since Talent and Forsgren, California, Nevada, Oregon, and Washington, all of which are within the jurisdiction of the Ninth Circuit Court of Appeals, have issued permits for the application of certain types of pesticides (e.g., products to control weeds and algae and products to control mosquito larvae). Other states have continued their practice of neither requiring nor issuing permits to people who apply pesticides to Waters of the United States. These varying practices reflected the substantial uncertainty among regulators, the regulated community, and the public regarding how the CWA applies to discharges to Waters of the United States from the application of pesticides.

Additionally, the Second Circuit Court of Appeals addressed the applicability of the CWA's NPDES permit requirements to pesticide applications. In Altman v. Town of Amherst (Altman), the court vacated and remanded for further development of the record a District Court decision holding that the Town of Amherst was not required to obtain an NPDES permit to spray mosquitocides over Waters of the United States. 47 Fed. Appx. 62, 67 (2nd Cir. 2002). In its opinion, the Second Circuit stated that "[u]ntil the EPA articulates a clear interpretation of current law – among other things, whether properly used pesticides released into or over water of the United States can trigger the requirement for NPDES permits * * * – the question of whether properly used pesticides can become pollutants that violate the CWA will remain open." Id. at 67.

In Fairhurst v. Hagener, the Ninth Circuit again addressed the CWA's applicability to pesticide applications. The court held that pesticides applied directly to a lake in order to eliminate non-native fish species, where there are no residues or unintended effects, are not "pollutants" under the CWA because they are not chemical wastes. 422 F.3d 1146 (9th Cir. 2005).

5. 2006 Agency Rulemaking Excluding Pesticides from the NPDES Permitting Program

On November 27, 2006, EPA issued a final rule (hereinafter called the "2006 NPDES Pesticides Rule") clarifying two specific circumstances in which an NPDES permit was not required to apply pesticides to or around water. They were: 1) the application of pesticides directly to water to control pests; and 2) the application of pesticides to control pests that are present over, including near, water where a portion of the pesticides will unavoidably be

deposited to the water to target the pests, provided that the application is consistent with relevant Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) requirements in both instances. The rule became effective on January 26, 2007.

6. Legal Challenges to the 2006 NPDES Pesticides Rule and Court Decision

On January 19, 2007, EPA received petitions for review of the 2006 NPDES Pesticides Rule from environmental and industry groups. Petitions were filed in eleven circuit courts with the case, National Cotton Council, et al, v. EPA, assigned to the Sixth Circuit Court of Appeals.

On January 7, 2009, the Sixth Circuit vacated EPA's 2006 NPDES Pesticides Rule under a plain language reading of the CWA. National Cotton Council of America v. EPA, 553 F.3d 927 (6th Cir., 2009). The Court held that the CWA unambiguously includes "biological pesticides" and "chemical pesticides" with residuals within its definition of "pollutant." Specifically, an application of chemical pesticides that leaves no excess portion is not a discharge of a pollutant, and the applicator need not obtain an NPDES permit. However, chemical pesticide residuals are pollutants as applied if they are discharged from a point source for which NPDES permits are required. Biological pesticides on the other hand are always considered a pollutant under the CWA regardless of whether the application results in residuals or not and require an NPDES permit for all discharges from a point source.

In response to this decision, on April 9, 2009, EPA requested a two-year stay of the mandate to provide the Agency time to develop general permits, to assist NPDES-authorized states to develop their NPDES permits, and to provide outreach and education to the regulated community. On June 8, 2009, the Sixth Circuit granted EPA the two-year stay of the mandate.

On November 2, 2009, industry petitioners of the Sixth Circuit Case petitioned the Supreme Court to review the Sixth Circuit's decision. On February 22, 2010, the Supreme Court denied the request to hear industry's petition. On March 3, 2011, EPA requested an extension from April 9, 2011 to October 31, 2011 to allow sufficient time for EPA to engage in Endangered Species Act (ESA) consultation and complete the development of an electronic database to streamline requests for coverage under the Agency's general permit. EPA also requested more time to allow for authorized states to finish developing their state permits and for permitting authorities to provide additional outreach to stakeholders on pesticide permit requirements. On March 28, 2011, the U.S. Court of Appeals for the Sixth Circuit granted EPA's request for an extension to October 31, 2011.

As a result of the Court's decision to vacate the 2006 NPDES Pesticides Rule, on October 31, 2011, Operators must comply with NPDES permit requirements for discharges to Waters of the United States of biological pesticides, and of chemical pesticides that leave a residue. In response to the Court's decision, EPA proposed a general permit on June 4, 2010 to cover certain discharges resulting from pesticide applications. EPA Regional offices and State NPDES authorities may issue additional general permits or individual permits if needed. After consideration of comments received on the proposed permit and engaging in ESA consultation, EPA is issuing its final permit.

7. Implications of the Court's Decision

Irrigation return flow (which includes runoff from a crop field due to irrigation of that field) and agricultural stormwater runoff do not require NPDES permits, as exempted by the CWA. For example, runoff into engineered conservation measures on a crop field such as grassy swales and other land management structures that direct flow from the crop field is considered either irrigation return flow or agricultural stormwater. However, discharges from the application of pesticides, which includes applications of herbicides, into irrigation ditches and canals that are themselves Waters of the United States, are not exempt as irrigation return flows or agricultural stormwater, and do require NPDES permit coverage. This is because such pesticide discharges are not only point sources, but also that these pesticides are now defined as "pollutants" under the CWA due to the Sixth Circuit Court's decision. Some irrigation systems may not be Waters of the United States and thus discharges to those waters would not require NPDES permit coverage.

Neither the 2006 NPDES Pesticides Rule, the Sixth Circuit Court vacatur of that rule, nor this PGP have changed in any way the determination of whether certain types of stormwater runoff are required to obtain permit coverage, or under which permit coverage is required. This is true whether the runoff contains pesticides or pesticide residues resulting from the application of pesticides. In particular, non-agricultural stormwater runoff that may contain pesticides would not be eligible for coverage under this permit, and is not required to obtain NPDES permit coverage unless it was already required to do so prior to the Sixth Circuit decision or EPA designates a source for future stormwater permitting. Existing stormwater permits for construction, industry, and municipalities already address pesticides in stormwater. Thus, stormwater runoff is either: (a) already required to obtain NPDES permit coverage as established in section 402(p) of the CWA or (b) classified as a discharge for which NPDES permit coverage is not currently required. The regulations that specify what types of stormwater require NPDES permits can be found in 40 CFR §122.26.

EPA determined that the four use patterns included in the PGP would encompass the majority of pesticide applications that would result in point source discharges to Waters of the United States and generally represent the use patterns intended to be addressed by the 2006 rule that is now vacated. This permit does not cover, nor is permit coverage required, for pesticides applications that do not result in a point source discharge to Waters of the United States such as for the purpose of controlling pests on agricultural crops, forest floors, or range lands. However, the application of herbicides in Waters of the United States and the control of pests on plants grown in Waters of the United States, such as perennial obligate hydrophytes, is within the scope of coverage of this permit. This fact sheet does not identify every activity which may involve a point source discharge of pesticides to Waters of the United States that would require a permit; rather, the fact sheet focuses on the activities for which coverage under the PGP is available. The existence of this general permit does not alter the requirement that discharges of pesticides to Waters of the United States that are not covered by this permit be covered by an individual permit or another general permit.

8. Publication of Draft Pesticide General Permit

EPA published for purposes of public notice a draft NPDES pesticide general permit for point source discharges from the application of pesticides to Waters of the United States on June

4, 2010 for four specific pesticide use patterns (75 FR 31775). The draft permit was developed to apply in all 10 EPA Regions in those areas where EPA remains the NPDES permitting authority. The federal register notice for the draft permit briefly summarized the requirements in the draft permit and also identified a list of issues for which EPA was specifically asking for comment. In general, those issues included:

- Numbers, types, and sizes of entities that would be covered under this permit;
- Other activities that should be covered under this permit and for those activities, the applicable requirements;
- Whether discharges to impaired waters and Tier 3 waters should be eligible for coverage under this permit and if so, the applicable requirements;
- Whether the draft permit is clear and if it provides a logical approach to the expected sharing of responsibilities;
- Whether the Notice of Intent framework strikes an appropriate balance between capturing information on the largest applications and avoiding imposition of unreasonable burdens on smaller activities (and whether the thresholds for distinguishing between these two are appropriate);
- Who should be required to implement integrated pest management practices, what specific practices should be required, and what type of guidance is necessary;
- Whether other parameters or narrative water quality based effluent limitations would be appropriate;
- The value, feasibility, and safety of visual monitoring and how ambient water quality monitoring could be incorporated into the permit to assess compliance or to provide information that can be used to enhance the permit in the future; and
- The scope of Operators required to submit annual reports and the type, level of detail, and practical utility of the information being requested.

9. Public Meetings/Hearing Held on Draft Pesticide General Permit

During the public comment period of the draft pesticide general permit, EPA held three public meetings (Albuquerque on June 14, 2010, Boise on June 16, 2010, and Boston on June 21, 2010), one public hearing (Washington, DC on June 23, 2010), and a webcast (on June 24, 2010) to provide an overview of the draft permit requirements and the basis for those requirements, and to answer questions about the draft permit and how the public can best assist EPA in the public comment process. Summaries of information presented at those meetings and comments received are included in the official docket for this permit (Docket ID No. EPA-HQ-OW-2010-0257 available at: www.regulations.gov).

10. Public Comments Received on Draft Pesticide General Permit

EPA received 771 sets of written comments on the draft pesticide general permit. EPA has prepared a response to comments document which is available in the docket for this permit. Comments were used to inform EPA's decision-making in finalizing this permit. This fact sheet does not discuss EPA's rationale for changes made to the permit based on public comment. EPA's responses to the comments, including the Agency's rationale for changes to the permit, are reflected in the response to comment document also available in the docket for this permit (Docket ID No. EPA-HQ-OW-2010-0257 available at: www.regulations.gov).

11. EPA's Posting of a Pre-publication Draft of the Final PGP

On April 1, 2011, EPA posted a pre-publication version of its draft final pesticide general permit for discharges of pesticide applications to U.S. waters. This draft final permit was not considered a "final agency action," and the Agency did not solicit public comment on this draft final permit. EPA provided a preview of the draft final permit to assist states in developing their own permits and for the regulated community to become familiar with the permit's requirements before it was to become effective. This reflected EPA's commitment to transparency and responding to the needs of stakeholders. The pre-publication version of the draft final pesticide general permit underwent interagency review pursuant to EOs 12866 and 13563. The draft final permit posted on April 1, 2011 contains largely identical requirements to the final permit being published today. The principle change is the addition of conditions to protect listed species as a result of consultation with the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA). There have also been changes to the timing of NOI submission deadlines and some additional clarifying changes, but these do not alter the intent of the pre-publication version posted in April.

12. ESA Consultation

The Endangered Species Act (ESA) of 1973 requires all Federal Agencies to ensure, in consultation with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) (together, the "Services"), that any Federal action carried out by the Agency is not likely to jeopardize the continued existence of any endangered species or threatened species (together, "listed" species), or result in the adverse modification or destruction of habitat of such species that is designated by the Services as critical ("critical habitat"). See 16 U.S.C. 1536(a)(2), 50 CFR 402. When a Federal agency's action "may affect" a protected species, that agency is required to consult with one or both of the Services, depending upon the endangered species, threatened species, or designated critical habitat that may be affected by the action (50 CFR 402.14(a)).

To evaluate how the PGP would likely affect listed species and their critical habitat (together, "listed resources"), EPA prepared a Biological Evaluation (BE), a copy of which is available in the PGP administrative record (Docket ID No. EPA-HQ-OW-2010-0257 available at: www.regulations.gov), which concluded that in some instances the PGP "may affect" listed resources. EPA provided that BE to the Services on July 30, 2010.

On June 17, 2011, NMFS provided EPA with its *Draft Endangered Species Act Section 7 Consultation Biological Opinion on the U.S. Environmental Protection Agency's Proposed Pesticides General Permit, (draft* Biological Opinion). That draft Biological Opinion tentatively concluded that the issuance of the PGP would jeopardize the continued existence of 33 listed species and result in the destruction or adverse modification of critical habitat that has been designated for 29 of those species. This draft Biological Opinion also included, a Reasonable and Prudent Alternative (RPA) intended to avoid the likelihood of jeopardizing the continued existence of any listed species or destruction or adverse modification of critical habitat. The species and habitat identified in NMFS's draft Biological Opinion are identified in the PGP as "NMFS Listed Resources of Concern" as defined in Appendix A of the permit. The RPA was to be applicable in areas where the PGP overlaps with NMFS Listed Resources of Concern (i.e.,

portions of Idaho, Massachusetts, the District of Columbia, some tribal lands, and potentially for federal facilities in Delaware, Vermont and Washington).

EPA sought public comment on NMFS' draft RPA, noticing, to the public, a 30-day request for comments on June 24, 2011. EPA received approximately 300 sets of written comments on the draft Biological Opinion and provided those comments to NMFS for their consideration in finalizing the Biological Opinion. Comments received on the draft BiOp are included in the administrative record for this permit (Docket ID No. EPA-HQ-OW-2010-0257 available at: www.regulations.gov).

On October 14, 2011, NMFS provided EPA with its final BiOp. The final PGP reflects the revisions to the draft permit that were made following consultation with NMFS and are designed to ensure that discharges allowed under the PGP are not likely to cause jeopardy to the continued existence of listed species and their critical habitat. These new permit provisions include eligibility criteria for permit coverage as well as requiring compliance with technology-based effluent limitations in Part 2.2 and recordkeeping and reporting requirements for Decision-makers with discharges to Waters of the United States containing NMFS Listed Resources of Concern. The final PGP is consistent with the RPA set forth in NMFS' final BiOp

During ESA consultation, NMFS determined that it was appropriate to focus the list of resources of concern on certain listed species of salmonids, eulachon and sturgeon. NMFS determined that such resources of concern reside in approximately the middle third of the State of Idaho, the Merrimack and Connecticut Rivers in the State of Massachusetts and the Potomac River in Washington, D.C. There may also be some overlap with species on some tribal lands in the States of Washington, Oregon and California and some Federal facilities in Washington.

These new provisions of the PGP apply to Decision-makers in the limited areas where the NMFS Listed Resources of Concern, as defined in Appendix A of the permit, exist. EPA estimates that less than 2 % of the total number of Operators in the 6 states in which this PGP will apply may need to meet additional permit requirements than they would otherwise have to in order to meet the PGP's ESA related provisions. Such additional permit requirements include submittal of an NOI, implementing IPM-like practices, and submitting annual reports. Most of these Operators are small entities likely located in either Idaho or Massachusetts. Outreach efforts focused on assisting these small entities in determining whether they discharge to areas with resources of concern, whether they can be covered under this PGP, how to apply for permit coverage and what permit requirements they would be responsible for meeting will be elements included in the outreach and education efforts. In addition, EPA will develop a template to assist small operators in determining if they will discharge to Waters containing NMFS Listed Resources of Concern, and if so, how they can avoid adverse effects to those resources in order to obtain permit coverage. Information on such outreach activities will be available on EPA's NPDES website at www.epa.gov/npdes/pesticides.

EPA notes that these new provisions were developed only for areas for which this PGP applies (all EPA authorized areas). The 44 states authorized to administer their own NPDES programs are not bound by the same ESA consultation requirements that bind EPA, and thus, these new permit terms are not federal NPDES requirements that the NPDES-authorized states must adopt. Some states may have their own endangered species related requirements under state law and these may be reflected in state permits.

NMFS has issued four biological opinions on the authorization pursuant to FIFRA of the use of 24 pesticides. NMFS determined that the use of some of those pesticides was likely to jeopardize listed species or destroy or adversely modify designated critical habitat. NMFS included RPAs for the authorization of these pesticides in order to avoid likely jeopardy to those species or destruction or adverse modification of designated critical habitat. EPA understands that NMFS will consider this information when evaluating whether any discharges authorized by the PGP would be likely to have any adverse effects on listed resources.

A committee of the National Research Council (NRC) is examining scientific and technical issues related to the methods and assumptions used by the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS), and the National Oceanic and Atmospheric Administration (NOAA) to conduct scientific assessments of ecological risks from pesticides registered by EPA under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) to species listed under the Endangered Species Act (ESA). The range of scientific studies needed to make such assessments will be considered, including ecological, agricultural, hydrological, toxicological, and exposure studies. The committee will develop conclusions reflecting the use of scientific principles and to facilitate a more holistic approach to assessing risks across the agencies, considering the intent of the ESA and of FIFRA. The expectation is that the NRC's conclusions would also be applied to the methods and assumptions used for scientific assessment of federal actions under the Clean Water Act to species listed under the ESA. See http://www8.nationalacademies.org/cp/projectview.aspx?key=49396.

For informational purposes, EPA is providing the following citations to four Biological Opinions issued by NMFS in recent years that evaluated specific pesticides.

- November 18, 2008, *National Marine Fisheries Service Endangered Species Act Section 7 Consultation Biological Opinion Environmental Protection Agency Registration of Pesticides Containing Chlorpyrifos, Diazinon, and Malathion* at http://www.epa.gov/espp/litstatus/1st-biop.pdf

- April 20, 2009, *National Marine Fisheries Service Endangered Species Act Section 7 Consultation Biological Opinion Environmental Protection Agency Registration of Pesticides Containing Carbaryl, Carbofuran, and Methomyl* at http://www.epa.gov/oppfead1/endanger/litstatus/wtc/carbama-biop-4-20-09.pdf

- August 31, 2010, *National Marine Fisheries Service Endangered Species Act Section 7 Consultation Biological Opinion Environmental Protection Agency Registration of Pesticides Containing Azinphos methyl, Bensulide, Dimethoate, Disulfoton, Ethoprop, Fenamiphos, Naled, Methamidophos, Methidathion, Methyl parathion, Phorate and Phosmet* at http://www.epa.gov/oppfead1/endanger/litstatus/final-batch-3-opin.pdf

June 30, 2011 *National Marine Fisheries Service Endangered Species Act Section 7 Consultation Biological Opinion Environmental Protection Agency Registration of Pesticides 2,4-D, Triclopyr BEE, Diuron, Linuron, Captan, and Chlorothalonil* at http://www.epa.gov/espp/litstatus/final-4th-biop.pdf.

EPA continues to be in consultation with FWS. Since EPA is issuing the PGP in response to a court decision vacating EPA's 2006 NPDES Pesticides Rule, after October 31, 2011 and without coverage by an NPDES permit, certain discharges to Waters of the United States from the application of pesticides will be in violation of the Clean Water Act (CWA), and could be subject to citizen suits or enforcement actions. For these reasons, EPA has determined that it is of the utmost importance to issue the final PGP while consultation is pending. Once consultation is complete, EPA will modify this permit should the Agency find that the consultation demonstrates that different permit limits or additional conditions to protect listed species or critical habitat are warranted. Any such change would require public notice and an opportunity for comment. The current permit would remain in effect during those proceedings.

EPA's decision to issue this permit while consultation is ongoing is consistent with section 7(d) because its issuance does not foreclose either the formulation by the Services, or the implementation by EPA, of any alternatives that might be determined in the consultation to be necessary to comply with section 7(a)(2). If consultation reveals new information warranting different effluent limits or conditions to protect listed species or critical habitat, EPA plans to modify this permit under 40 C.F.R. §122.62(a)(2) to incorporate those limits or conditions. EPA may, as a result of completion of consultation with FWS, revoke the permit for use in areas where FWS determines the permit is likely to jeopardize the continued existence of listed species or adversely modify designated critical habitat. Should EPA opt to revoke the permit for reasons described above, Operators currently covered under the permit in those areas would be given a reasonable amount of time to seek coverage under an individual permit or other general permit consistent with provisions for permit revocation in 40 CFR Part 122.62.

EPA has determined, moreover, that issuing this permit pending the completion of consultation is not likely to jeopardize the continued existence of listed species or adversely modify designated critical habitat. The attached memo, included in the administrative record for this permit (Docket ID No. EPA-HQ-OW-2010-0257 available at: www.regulations.gov), discusses in greater detail the conservative nature of the biological evaluation and why the proposed action under the PGP will lead to increased protection of and not be likely to jeopardize the continued existence of listed species or adversely modify designated critical habitat.

13. Provisions in the Final PGP Added Following Consultation with NMFS

The following discussion summarizes the requirements in the permit added following consultation with NMFS, which are designed to ensure that discharges covered under this permit are not likely to adversely effect NMFS Listed Resources of Concern, except as provided in Criterion B, C, and, for 60 days, D, in part 1.1.2.4 of the permit.

EPA's PGP requires anyone seeking permit coverage to determine if their pesticide discharges would be to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit. The locations of NMFS Listed Resources of Concern are publicly available at www.epa.gov/npdes/pesticides. Any Decision-maker who discharges to Waters of the United States containing NMFS Listed Resources of Concern is required to:

a. Submit a Notice of Intent (NOI) for coverage under the PGP;
b. Implement pest management measures to meet the technology-based effluent limitations that are based on IPM principles except those Decision-makers that will need to submit an NOI only because they discharge to Waters of the United States containing NMFS Listed Resources of Concern and that also comply with provisions in Part 1.6; and
c. Submit annual reports.

NOIs for point source discharges to Waters of the United States containing NMFS Listed Resources of Concern are due at least 30 days prior to commencement of discharge to Waters of the United States except where pesticide applications are being made in response to a Declared Pest Emergency Situation, as identified in Appendix A of the permit. For those Declared Pest Emergency Situations, NOIs are due no later than 15 days after beginning discharge. Declared Pest Emergency Situations are eligible for permit coverage for a period of at least 60 days after beginning to discharge. Operators may continue to discharge after 60 days in these situations unless EPA notifies them that the discharge raises concern related to NMFS Listed Resources of Concern, in which case EPA will either direct that the discharge cease within the 60 day timeframe, or specify additional conditions to protected NMFS Listed Resources of Concern.

Decision-makers can contact EPA or NMFS in advance of NOI submission to assess permit coverage eligibility for planned discharges to Waters of the United States containing NMFS Listed Resources of Concern. EPA expects this advance contact will help Decision-makers determine if planned pesticide applications are or are not likely to cause adverse effects to listed species and if so, to identify steps that should be taken to ensure that such adverse effects do not occur.

NOIs submitted for any point source discharge to Waters of the United States containing NMFS Listed Resources of Concern (except for those applications where: (1) consultation under ESA Section 7 has occurred already; (2) one of the Services issued a permit for “take” under ESA Section 10 action; (3) or the Decision-maker has written correspondence from NMFS that pesticide application activities performed consistent with appropriate measures will avoid or eliminate the likelihood of adverse effects) must include the following information:

1. Description of the location of the pest management area in detail or a map of the location;
2. Pest(s) to be controlled;
3. Pesticide product(s) to be discharged and method of application;
4. Planned quantity and rate of discharge(s) for each method of application;
5. Number of planned discharges;
6. Approximate date(s) of planned discharge(s);
7. Rational supporting the determination whether the discharge is likely to adversely affect a NMFS Listed Resource of Concern, including a description of appropriate measures to be undertaken to avoid or eliminate the likelihood of adverse effects; and
8. Signed certification by the Decision-maker consistent with the six criteria (A-F) outlined below.

In the event an NOI is submitted for a Declared Pest Emergency Situation, the NOI must include information contained in items 1 through 7 listed above. Decision-makers must also include equivalent information in items 1 thorough 6, listed above, for those discharges that have already occurred for an NOI filed 15 days after beginning to discharge.

EPA recognizes that implementation of pest management measures as specified in the permit may involve a degree of "adaptive management" such that exact timing and quantities of applications cannot be determined in advance for the duration of the permit. EPA expects the Decision-maker to provide the required information to the extent feasible and consistent with the implementation of the selected pest management measures.

EPA will notify NMFS immediately upon submission of any NOI that identifies discharges to Waters of the United States containing NMFS Listed Resources of Concern. NMFS will have 30 days from the NOI submission date to provide EPA with a determination as to whether it believes the eligibility criterion of "not like to adversely affect listed species or designated critical habitat," has been met, could be met with conditions that NMFS specifies, or has not been met. EPA expects to rely on NMFS' expertise with regard to NMFS Listed Resources of Concern when considering whether the prospective discharges would have any adverse effects on NMFS Listed Resources of Concern, and whether to withhold authorization. If NMFS does not provide EPA with this information within 30 days of EPA posting on the Internet receipt of a complete and accurate NOI, the discharges will be authorized 30 days after EPA posts on the Internet receipt of a complete NOI. EPA could, after receiving NMFS' determination (or other issues raised by other parties) decide to place the NOI on hold (i.e., delay authorization to discharge) if necessary. EPA may authorize certain discharges in less than 30 days, but no fewer than 10 days, for any discharges under Criterion B, C, or E of Part 1.1.2.4 of the permit (for which NMFS has already evaluated the effects of these discharges).

Annual reports submitted by the Decision-makers for these point source discharges to Waters of the United States containing NMFS Listed Resources of Concern will include the following information:

a. A description of treatment area, including location and size,
b. The approximate date of any discharge,
c. Identification of any waters of the United States to which pesticide pollutants are discharged,
d. The pesticide use pattern resulting in any discharge,
e. Any target pest(s),
f. Contact information for the decision-maker or any pesticide applicator,
g. The total amount of each pesticide product applied for the reporting year by the application method,
h. If applicable, an annual report of any adverse incidents as a result of any discharge, and
i. If applicable, a description of any corrective action.

EPA will collect and summarize these annual reports and provide such information to NMFS on an annual basis.

The following outlines the criteria to determine if an Operator may be authorized for permit coverage consistent with the principle provisions of this permit relating to the protection of NMFS Listed resources of Concern.

A. Pesticide application activities will not result in a point source discharge to one or more Waters of the United States containing National Marine Fisheries Service (NMFS) Listed Resources of Concern, as defined in Appendix A, for this permit. In this case, no further certification is necessary. Decision-makers not otherwise required to submit an NOI are not required to do so merely to check Criterion A. However, Decision-makers who must submit an NOI anyway should check Criterion A if they do not discharge to a Water of the United States containing NMFS Listed Resources of Concern.
B. Pesticide application activities will result in a point source discharge to one or more receiving Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A, but consultation with NMFS under section 7 of the ESA has been concluded for pesticide application activities covered under this permit. Consultations can be either formal or informal, and would have occurred only as a result of a separate federal action. The consultation addressed the effects of pesticide discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and must have resulted in either:
   i. A biological opinion from NMFS finding no likely jeopardy to listed species and no destruction/adverse modification of federally-designated critical habitat; or
   ii. Written concurrence from NMFS with a finding that the pesticide discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated critical habitat.
C. Pesticide application activities will result in a point source discharge to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A, but any “take” <u>of these resources</u> associated with such pesticide application activities <u>has</u> been authorized through NMFS’ issuance of a permit under section 10 of the ESA, and such authorization addresses the effects of the pesticide discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. (The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. See Section 3 of the Endangered Species Act, 16 U.S.C. § 1532(19).)
D. Pesticide application activities were, or will be, discharged to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A, but only in response to a Declared Pest Emergency Situation. Decision-makers must provide EPA with their rationale supporting the determination whether the discharge is likely to adversely affect listed species, including the description of appropriate measures to be undertaken to avoid or eliminate the likelihood of adverse effects.

E. Pesticide application activities for which permit coverage is being requested in the NOI will discharge to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A. Eligible discharges include those where the Operator includes in the NOI written correspondence from NMFS that pesticide application activities performed consistent with appropriate measures will avoid or eliminate the likelihood of adverse effects.

F. Pesticide application activities for which permit coverage is being requested in the NOI will discharge to one or more Waters of the United Stated containing NMFS Listed Resources of Concern, as defined in Appendix A. Eligible discharges include those from pesticide application activities that are demonstrated by the operator as not likely to adversely affect federally-listed species or their designated critical habitat or that the pest poses a greater threat to the NMFS Listed Resources of Concern than does the discharge of the pesticide. Operators must provide EPA with their documentation demonstrating the basis for their finding.

Criteria E and F, at least 30 days prior to beginning to discharge, require an operator to demonstrate:

- Pesticides being discharged or to be discharged are known not to cause adverse effects, or are or will be discharged at concentrations determined not to cause adverse effects, to NMFS Listed Resources of Concern (Criterion F), or
- NMFS Listed Resources of Concern are or will not be exposed to pesticide pollutants produced by the discharge (e.g., species will not occur in the discharge area during that time of year, the species will not be present in the hydrologic unit in which the discharge will occur, the species is not present because of the presence of the pest being controlled, etc) (Criterion F), or
- Other considerations that demonstrate the discharge is not likely to adversely affect NMFS Listed Resources of Concern (Criterion F), or
- They have obtained written correspondence from NMFS indicating that pesticide application activities performed consistent with appropriate measures will avoid or eliminate the likelihood of adverse effects to Listed Resources of Concern. Eligibility under this criterion is contingent upon the Decision-maker following the measures described in correspondence from NMFS designed to avoid or eliminate the likelihood of adverse effects (Criterion E).

II. Structure of this Permit

1. General

This permit is written for the many specific areas of the country for which EPA remains the NPDES permitting authority. This permit is constructed in such a way that each Region will sign and issue the permit and include in that issuance CWA Section 401 certification language for areas in their Region covered by the permit. Specifically, this permit provides coverage for certain point source discharges that occur in areas not covered by an authorized State NPDES

permit program and includes specific areas (e.g., States, territories, Indian Country lands, or federal facilities) in all ten EPA Regions. The complete list of areas of geographic coverage of this permit, along with the NPDES permit numbers are listed in Appendix C of the permit.

Note that this permit covers the State of Alaska even though Alaska has recently been authorized to administer the NPDES program as the State is not obligated to assume permitting responsibilities for discharges from pesticide applications until late 2011. Thus, this permit will cover discharges in the State of Alaska until such time as any State permits take effect. Also, the Oklahoma Department of Environmental Quality (ODEQ), who is the NPDES permitting authority, currently does not have the authority to administer the NPDES program for the types of pesticide discharges covered under this permit. Pursuant to Oklahoma state law, Oklahoma's Department of Agriculture, Food, and Forestry (ODAFF) is the only state agency with jurisdiction to regulate pesticide applications within the state. Since ODAFF is not currently authorized to administer the NPDES program, the state does not have the authority to issue permits for discharges from the application of biological pesticides or chemical pesticides. Thus, EPA's PGP covers discharges in the State of Oklahoma.

States that are authorized to issue NPDES permits for the control of discharges to Waters of the United States from the application of pesticides will be developing their own NPDES permits to cover such discharges. Nothing in the federal regulations precludes a state from adopting or enforcing requirements that are appropriate to address discharges in their state or are more stringent or more extensive than those required under the NPDES regulations. In fact, the Clean Water Act is meant to serve as a baseline for state environmental protection. The Clean Water Act and corresponding NPDES regulations require that permits, at a minimum, include the requirements detailed in Part 122.44 (but not necessarily in the same way as in this permit). States are free to incorporate additional or different requirements that they feel are necessary to adequately protect water quality. Similarly, how EPA and states interpret information from which permit requirements are developed may differ. For example, the regulations, as written at 122.44(i) specify that monitoring requirements be included to assure compliance with permit limitations. One permit writer may make a best professional judgment (BPJ) determination that monitoring of discharges reasonably should occur <u>during</u> pesticide application while a second permit writer may make a BPJ determination that monitoring of discharges should reasonably be performed <u>after</u> pesticide application. It is reasonable that the two different permit writers may come to different conclusions about how best to incorporate this requirement into the permit.

Throughout this fact sheet (and permit), EPA uses consistent terms when referring to what activity or discharge will be eligible for coverage and who will be responsible to comply with the terms of the permit. Specifically, the permit holder is referred to as the "Operator." This term has a similar meaning to the term "permittee" which is also used in the fact sheet; generally, the term permittee is specific to the period of time that an Operator or contractor is actually covered under the permit. More details on how an Operator is to obtain permit coverage and the applicable permit requirements are provided in Part III of the fact sheet.

The permit is divided into nine parts: (1) coverage under this permit, (2) technology-based effluent limitations, (3) water quality-based effluent limitations, (4) monitoring, (5) pesticide discharge management plan, (6) corrective action, (7) recordkeeping and annual reporting, (8) EPA contact information and mailing addresses, and (9) permit conditions applicable to specific states, Indian country lands, or territories. Additionally, the permit

includes seven appendices with additional conditions and guidance for permittees: (A) definitions, abbreviations, and acronyms, (B) standard permit conditions, (C) areas covered, (D) Notice of Intent Form, (E) Notice of Termination Form, (F) Pesticide Discharge Evaluation Worksheet, and (G) Annual Report Template.

Operators should carefully read each part of the permit to assess whether or what portion of the requirements in each part may apply to their activities. As will be discussed in more detail in Part III of this fact sheet, the permit establishes different requirements for different types of pesticide use patterns, different types of Operators, and different sizes of areas treated and managed for the control of pests. The organization of the permit is intended to clarify the applicable requirements for Operators to the greatest extent possible.

2. Conformance to Recent Court Decisions

EPA has structured this permit to conform to recent relevant court decisions.

One of these cases held that because the terms of the Nutrient Management Plan (NMP) employed by concentrated animal feeding operations (CAFO) imposed restrictions on discharges, those restrictions amounted to effluent limitations that needed to be made part of the permit and to be subject to public and permit writer review. Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486 (2nd Cir. 2005). In this respect, this permit is different from the CAFO requirements. In this permit, EPA explicitly establishes effluent limitations in Parts 2 and 3 that are independent of any documentation and recordkeeping requirements regarding implementation of the limitations. In a separate part of the permit (Part 5) there is a requirement to develop a Pesticide Discharge Management Plan (PDMP). The PDMP is not a limitation and does not itself impose requirements on discharges. These are already imposed by the limitations in Parts 2 and 3. The PDMP is rather a tool for those Operators who are defined as Decision-makers to document, among other things, how Pest Management Measures will be implemented to comply with the permit's effluent limitations.

Effluent Limitations in the Permit

Part 2 of the permit contains the technology-based effluent limitations. Part 3 of the permit contains the water quality-based effluent limitations. These Parts of the permit contain effluent limitations, defined in the CWA as restrictions on quantities, rates, and concentrations of constituents that are discharged. CWA section 502(11). Violation of any of these effluent limitations constitutes a violation of the permit. As is described in more detail in Part III.2 of the fact sheet, under the CWA these effluent limitations can be narrative rather than numeric.

The technology-based effluent limitations set forth in Part 2 require the Operator to minimize the discharge of pesticides to Waters of the United States from the application of pesticides. Consistent with the control level requirements of the CWA, the term "minimize" means to reduce and/or eliminate pesticide discharges to Waters of the United States through the use of Pest Management Measures to the extent technologically available and economically achievable and practicable for the category or class of point sources covered under this permit taking into account any unique factors relating to the Operators to be covered under the permit. The technology-based effluent limitations section is divided into two parts. The first part applies to all Applicators and addresses the general requirement to minimize discharges from application

of pesticides. In this part, all Applicators must minimize discharges of pesticides by using only the amount of pesticide product per application and frequency of pesticide applications necessary to control the target pest, performing regular maintenance activities, calibrating and cleaning/repairing application equipment, and assessing weather conditions in the treatment area. The second part requires certain Decision-makers to implement pest management measures that involve the following: (1) identifying and assessing the pest problem; (2) assessing effective pest management; and (3) following specified procedures for pesticide application (see Part 2.2 of the PGP).

In addition to the technology-based effluent limitations, Part 3 of the PGP contains the water-quality-based effluent limitations. The Operator must control its discharge as necessary to meet applicable water quality standards. Any discharge that results in an excursion of any applicable numeric or narrative EPA-approved state, territory, tribal or EPA-promulgated water quality standard is prohibited. In general, based on the data included in the record and the additional requirements in this permit in addition to FIFRA, EPA expects that compliance with the technology-based effluent limitations and other terms and conditions in this permit will meet applicable water quality-based effluent limitations. However, if at any time, the Operator or EPA determines that the discharge causes or contributes to an excursion of applicable water quality standards, the Operator must take corrective actions as required in Part 6, and document and report the excursion(s) to EPA as required in Part 7. Furthermore, consistent with Parts 3.0 and 6.3, EPA may impose additional water quality-based limitations on a site-specific basis, or require the Operator to obtain coverage under an individual permit, if information in an NOI, required reports, or from other sources indicates that, after meeting the technology-based limitations in this Permit, the discharges are not controlled as necessary to meet applicable water quality standards. EPA also notes that among the eligibility requirements for coverage under this permit are requirements that the permit does not cover discharges of any pesticide into a water impaired by a substance which either is an active ingredient in that pesticide or is a degradate of such an active ingredient, or into a Tier 3 water (except for pesticide applications made to restore or maintain water quality or to protect public health or the environment that either do not degrade water quality or only degrade water quality on a short-term or temporary basis). While not specifically framed as effluent limitations, these eligibility conditions further help to protect water quality on a water-body-specific basis.

Pesticide Discharge Management Plan (PDMP)

Distinct from the technology-based or water quality-based effluent limitation provisions in the permit, Part 5.0 of the permit requires Decision-makers that must submit an NOI and that are large entities to prepare a PDMP to document the implementation of Pest Management Measures being used to comply with the effluent limitations set forth in Parts 2.0 and 3.0. A large entity, as defined in Appendix A of the permit, is (1) a public entity that serves a population greater than 10,000 people or (2) a private enterprise that exceeds the Small Business Administration "size standards" as provided in 13 CFR 121.201.

In general, Part 5.0 requires that the following be documented in the PDMP: (1) pesticide discharge management team information; (2) problem identification; (3) pest management options evaluation; (4) response procedures pertaining to spills and adverse incidents; (5) documentation to support eligibility considerations under other federal laws, and (6) signature

requirements. The PDMP must be kept up-to-date and modified whenever necessary to document any corrective actions as necessary to meet the effluent limitations in this permit.

The requirement to prepare a PDMP is not an effluent limitation because it does not restrict quantities, rates, and concentrations of constituents that are discharged. CWA section 502(11). Instead, the requirement to develop a PDMP is a permit "term or condition" authorized under sections 402(a)(2) and 308 of the Act. Section 402(a)(2) states, "[t]he Administrator shall prescribe conditions for [NPDES] permits to assure compliance with the requirements of paragraph (1) of this subsection, including conditions on data and information collection, reporting, and such other requirements as he deems appropriate." The PDMP requirements set forth in the permit are terms or conditions under the CWA because the Operator is documenting information on how it is complying with the effluent limitations (and inspection and evaluation requirements) contained elsewhere in the permit. Thus, the requirement to develop a PDMP and keep it updated is no different than other information collection conditions, as authorized by section 402(a)(2), in other permits. Failure to have a PDMP, where required, is a violation of the permit.[1]

While Part 2 of the permit requires the Operator to select Pest Management Measures to meet the effluent limitations in this permit, the Pest Management Measures themselves described in the PDMP are not effluent limitations because the permit does not impose on the Operator the obligation to comply with the PDMP; rather, the permit imposes on the Operator the obligation to meet the effluent limitations prescribed in Parts 2.0 and 3.0. Therefore, the Operator is free to change as appropriate the Pest Management Measures used to meet the effluent limitations contained in the permit. This flexibility helps ensure that the Operator is able to adjust its practices as necessary to ensure continued compliance with the permit's effluent limitations. However, the permit also contains a recordkeeping condition that requires that the PDMP be updated with any such changes in the Operator's practices. See Part 5.2. Thus, if an Operator's on-the-ground practices differ from what is in the PDMP, this would constitute a violation of the permit's recordkeeping requirement to keep the PDMP up-to-date, and not per se a violation of the permit's effluent limitations, which are distinct from the PDMP. EPA recognizes, however, that because the PDMP documents how the Operator is meeting the effluent limitations contained in the permit, not following through with actions identified by the Operator in the PDMP as the method of complying with the effluent limitations in the permit is relevant to evaluating whether the Operator is complying with the permit's effluent limitations.

Public Availability of Documents

Part 5.3 of the permit requires that the Operator retain a copy of the current PDMP at the address listed on the NOI and it must be immediately available, at the time of an onsite inspection or upon request to EPA, a State, Tribal or local agency governing wastewater

[1] This permit is also consistent with the decision in Texas Independent Producers and Royalty Owners Assoc., et. al. v. EPA, 410 F.3d 964 (7th Cir. 2005), where petitioners challenged EPA's issuance of the construction general permit (CGP) that covers stormwater discharges. In that case, the Court found that neither the Stormwater Pollution Prevention Plan (SWPPP) nor the Notices of Intent (NOIs) are permits or permit applications because they do not amount to limits. 410 F.3d at 978. Further, the Court found that the permit requirement to develop a SWPPP is not an effluent limitation. For the PGP, the PDMP serves a similar purpose as the CGP SWPPP.

discharges and/or pesticide applications, and representatives of the United States Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS). While not required to be submitted to EPA, interested persons can request a copy of the PDMP through EPA, at which point EPA will likely request the Operator to provide a copy of the PDMP. By requiring members of the public to request a copy of the PDMP through EPA, the Agency is able to provide the Operators with assurance that any Confidential Business Information that may be contained within its PDMP is not released to the public. NOIs will be publicly available once submitted through the eNOI system. The NOIs generally will be available to the public for 10 days before permit coverage begins. During this time period, issues can be raised with EPA, who has the authority to deny coverage.

3. Sharing of Responsibilities

This general permit was developed with the understanding that there may be more than one responsible entity for a given discharge. As structured, the permit provides for sharing of responsibilities to meet the end goal of discharges being in compliance with permit requirements. The NPDES regulations state that "Operators" are responsible for achieving permit compliance. Specifically, 40 CFR 122.21(b) clarifies that when an activity is owned by one person but it is operated by another person (e.g. contractor), it is the Operator's duty to meet terms of the permit. EPA acknowledges, however, that in many instances the owner may still perform Operator duties; as such, they may still be required to obtain permit coverage, even in situations in which, for example, the owner hires a contractor to apply the pesticides to control pests. The PGP includes a definition of "Operator" in Appendix A of the permit that is intended to clarify this point, focusing on the fact that Operator control exists both at the "Decision-maker" level about how to control pests, including financial considerations, as well as at the pesticide Applicator" level (such as calibration of pesticide application equipment). In these instances, both Operators, i.e., the Decision-Maker and the Applicator, are required to obtain NPDES permit coverage; however, the permit strives to minimize any potential duplication of effort by identifying which Operator is responsible for certain permit conditions. The final permit clarifies these responsibilities by identifying whether EPA expects these activities to be performed by all Operators, or just the Decision-maker or the Applicator.

Entities such as subcontractors that are hired by an owner or other entity but are under the supervision of such owner or entity generally are not Operators. Similarly, entities are likely not an Operator if, for example, they own the land, but the activities are being performed outside of their control (e.g., a public entity is spraying for mosquitoes over private property, or a private party is spraying for weeds on public lands leased from the federal government).

EPA encourages Operators to use already prepared information and explore possible cost savings by sharing responsibilities for implementing aspects of this permit. For example, a mosquito control district may have developed something for their FIFRA program and they could assume the overall coordination of an integrated pest management program while a hired contractor may be responsible for minimizing the pesticide discharge and for site monitoring and maintaining and calibrating pesticide application equipment. In instances where multiple Operators are responsible for the discharge from larger pesticide application activities, some form of written explanation of the division of responsibilities should be documented. However, any and all Operators covered under this permit are still responsible, jointly and severally, for

any violation that may occur, though EPA may consider this written division of responsibilities when determining the appropriate enforcement response to a violation.

III. Summary of Permit Conditions

1. Coverage under this Permit

1.1. Eligibility

1.1.1 Activities Covered

Only Operators meeting the eligibility requirements outlined in the PGP may be covered under the permit. If an Operator does not meet the eligibility provisions described in Part 1.1 of the PGP, the Operator's point source discharges to Waters of the United States from the application of pesticides will be in violation of the CWA, unless the Operator has obtained coverage under another permit or the Clean Water Act exempts these discharges from NPDES permit requirements. The activities covered by this permit generally include the use patterns and types of pest control activities described in the vacated 2006 NPDES Pesticides Rule. As was discussed in that rule, agricultural stormwater and irrigation return flow are exempt from NPDES permits. Also, applications that do not reach Waters of the United States do not need permit coverage. Thus, the final PGP, consistent with the permit as proposed, covers the discharge of pesticides (biological pesticides and chemical pesticides which leave a residue) to Waters of the United States resulting from the following use patterns: (1) Mosquito and Other Flying Insect Pest Control; (2) Weed and Algae Control; (3) Animal Pest Control; and (4) Forest Canopy Pest Control as summarized below:

<u>Mosquito and Other Flying Insect Pest Control</u>
This use pattern includes the application, by any means, of chemical and biological insecticides and larvicides into or over water to control insects that breed or live in, over, or near Waters of the United States. Applications of this nature usually involve the use of ultra low volume sprays or granular larvicides discharged over large swaths of mosquito breeding habitat and often are performed several times per year.

<u>Weed and Algae Pest Control</u>
This use pattern includes the application, by any means, of contact or systemic herbicides to control vegetation and algae (and plant pathogens such as fungi) in Waters of the United States and at water's edge, including ditches and/or canals. Applications of this nature typically are single spot pesticide applications to control infestations or staged large scale pesticide applications intended to control pests in several acres of waterway. Pesticide applications in a treatment area may be performed one or more times per year to control the pest problem.

<u>Animal Pest Control</u>
This use pattern includes the application, by any means, of pesticides into Waters of the United States to control a range of animal pests for purposes such as fisheries management, invasive species eradication or equipment operation and maintenance. Applications of this nature are often made over an entire or large portion of a waterbody

as typically the target pests are mobile. Multiple pesticide applications to a waterbody for animal pest control are often made several years apart.

Forest Canopy Pest Control
This use pattern includes pest control projects in, over, or to forest canopies (aerially or from the ground) to control pests in the forest canopy where Waters of the United States exist below the canopy. Applications of this nature usually occur over large tracts of land, and are typically made in response to specific pest outbreaks. EPA understands that for this use pattern pesticides will be unavoidably discharged into Waters of the United States in the course of controlling pests over a forest canopy as a result of pesticide application. These pests are not necessarily aquatic (e.g., airborne non-aquatic insects) but are detrimental to industry, the environment, and public health. Note: EPA recognizes that mosquito adulticides are applied to forest canopies, and this application is covered under the "Mosquito and Other Flying Insect Pest Control" use pattern.

Prior to initiating the 2006 NPDES Pesticides Rule, the Agency had interpreted the Clean Water Act and its implementing regulations as not requiring an NPDES permit for forest pest control activities. The rule stated that pesticides applied consistently with FIFRA do not require an NPDES permit in certain circumstances, including the application of insecticides to a forest canopy. 71 Fed. Reg. at 68,482. In vacating the 2006 NPDES Pesticides Rule, the Sixth Circuit Court of Appeals held that "dischargers of pesticide pollutants are subject to the NPDES permitting program in the Clean Water Act." National Cotton Council, 553 F.3d 927, 940. Therefore, the holding of National Cotton Council has overtaken the 2003 General Counsel Memorandum as well as the 2006 rule. Other Courts have issued decisions consistent with National Cotton Council. Northwest Envt'l Def. Ctr. v. Brown, 617 F.3d 1176, 1191 (9th Cir. 2010) ("the [silviculture] exemption ceases to exist as soon as the natural runoff is channeled and controlled in some systematic way through a 'discernible, confined and discrete conveyance' and discharged into waters of the United States"); Peconic Baykeeper v. Suffolk Cty., 600 F.3d 180, 189 (2nd Cir. 2010) (holding that trucks and helicopters that spray pesticides are point sources under the CWA.) Thus, point source discharges to Waters of the United States from pesticides applied for forest pest control activities need to obtain an NPDES permit.

As discussed above, EPA's decision to include specific use patterns in this PGP generally stems from the Agency's 2006 NPDES Pesticides Rule. That rule provided that NPDES permits are not required for the application of pesticides when these pesticides are applied consistent with all relevant requirements under FIFRA (*i.e.,* those relevant to protecting water quality), in the following two circumstances:

1) The application of pesticides directly to Waters of the United States in order to control pests. Examples of such applications include applications to control mosquito larvae, aquatic weeds, or other pests that are present in the Waters of the United States.

2) The application of pesticides to control pests that are present over Waters of the United States, including near such waters, where a portion of the pesticides will unavoidably be deposited into Waters of the United States in order to target pests effectively; for example, when insecticides are aerially applied to a forest canopy where Waters of the United States may be present below the canopy or when

pesticides are applied over or near water for the control of adult mosquitoes or other pests.

However, as a result of the 6th Circuit Court's decision, what did not require an NPDES permit in the 2006 rule, does require an NPDES permit now.

EPA reasoned that such pesticide products were not "pollutants" because they served the beneficial purpose of controlling pests. In promulgating the 2006 NPDES Pesticides Rule, EPA expressly noted that the rule did not cover either "spray drift" – the airborne movement of pesticide sprays away from the target application site into Waters of the United States – or applications of pesticides to terrestrial agricultural crops where runoff from the crop, either as irrigation return flow or from stormwater, discharges into Waters of the United States.

Consistent with the 2006 NPDES Pesticides Rule, this PGP does not cover spray drift resulting from pesticide applications. Instead, to address spray drift, EPA established a multi-stakeholder workgroup under the Pesticides Program Dialogue Committee (PPDC), an advisory committee chartered under the Federal Advisory Committee Act (FACA) to explore policy issues relating to spray drift. The goals of the workgroup are to: (1) improve the understanding of the perspectives of all stakeholders regarding pesticide spray drift; (2) find common ground for further work toward minimizing both the occurrence and potential adverse effects of pesticide spray drift; (3) develop options for undertaking work where common ground exists; and (4) explore the extent of drift, even with proper usage, and the range and effectiveness of potential responses to unacceptable levels of off-target drift. On November 4, 2009, EPA issued a draft Pesticide Registration Notice (PR Notice) for public comment. The actions detailed in the PR Notice focus on improving the clarity and consistency of pesticide labels to reduce spray drift and prevent harm to human health and the environment. The draft PR Notice and related documents are available in Docket EPA-HQ-OPP-2009-0628 at www.regulations.gov. EPA is currently reviewing the public comments received.

Scope of Permit

As stated above, the Sixth Circuit found that if a chemical pesticide leaves any excess or residue after performing its intended purpose, such excess or residue would be considered a pollutant under the CWA. The Court also found that, unlike chemical pesticides, not only would the residue and excess quantities of a biological pesticide be considered a pollutant, but so too would the biological pesticide itself under the CWA.

Although the court did not define what a residual is, for purposes of this permit, EPA assumes that most if not all chemical pesticides will leave a residual once the product has performed its intended purpose, unless the Operator can show otherwise.

EPA offers the following guidance with respect to the use patterns of chemical pesticides covered by this general permit.

1. If the application of a chemical pesticide is made <u>over</u> Waters of the United States to control pests <u>over</u> the water, any amount of the pesticide that falls into Waters of the United States is "excess" pesticide and would require coverage by an NPDES permit. Based on field studies of pesticide applications, the Agency expects that some portion

of every application of a pesticide made over Waters of the United States will fall directly into such waters and thus assumes that applications will trigger the requirement for an NPDES permit. A permit is not necessary if no portion of a chemical pesticide applied over Waters of the United States will fall into those waters.

2. If the application of a chemical pesticide is made into Waters of the United States to control a pest in such waters, once the pesticide no longer provides any pesticidal benefit, any amount of the pesticide that remains in those waters is a "residual" and would require coverage by an NPDES permit. Additionally, as the Sixth Circuit reasoned, the residual is discharged at the time of a pesticides initial application. Based on field studies of pesticides applied into water, the Agency expects that some portion of every application of a pesticide made into Waters of the United States will leave a residual in those waters and thus assumes every application will trigger the requirement for an NPDES permit. EPA expects that an entity applying pesticides with a discharge to Waters of the United States who wishes to dispute this assumption would be expected to provide scientific data supporting such a determination. Such data should show what level of the pesticide can be detected in water, and at what level in water the pesticide provides a pesticidal benefit. Such data should address the properties of the chemical pesticide under different water conditions (e.g., different pH, organic content, temperature, depth, etc.) that might affect the pesticide's properties. A permit would not be necessary if it is determined that a residual did not enter Waters of the United States.

3. This permit authorizes discharges associated with four categories of pesticide application activities: mosquito and other flying insect pest control, weed and algae pest control, animal pest control, forest canopy pest control. As noted above, only point source discharges of pollutants to Waters of the United require a permit, and it is beyond the scope of this Fact Sheet to identify all specific activities that do or do not require a permit. However, to the extent that activities that fall within the four covered categories require a permit, they can be authorized by this general permit if all eligibility requirements are met. For example, discharges to control pests in or near areas that are Waters of the United States, even when these areas are dry for much of the year, may be covered by this permit, if one is required. This would include discharges on forest or range lands that include dry washes and ephemeral streams, to control pests that may be found in these occasionally wet areas, including pests that may also be found in upland areas. For two of the categories, weed and algae pest control and animal pest control, the permit specifies that covered activities include applications to control pests "in water and at water's edge." EPA intends for the phrase "at water's edge" to allow coverage of activities targeting pests that are not necessarily "in" the water but are near the water such that control of the pests may unavoidably involve a point-source discharge of pesticides to Waters of the United States. The category forest canopy pest control is for applications to a forest canopy. EPA intends that this can include both mature and immature forest canopies, including canopies that may not be continuously connected, where control of pests associated with the canopy (i.e., branches and leaves of the trees) may unavoidably involve point source discharges of pesticides to Waters of the United States.

For purposes of this permit, EPA is relying on existing regulatory definitions in 40 CFR 174.3 and 158.2100(a) developed under FIFRA to define the term "biological pesticides." For purposes of this permit, EPA identifies biological pesticides (also called "biopesticides" under FIFRA regulations) to include microbial pesticides [40 CFR 158.2100(b)], biochemical pesticides [40 CFR 158.2000(a)(1)] and plant-incorporated protectants. [40 CFR 174.3]

How the Court's Decision Expands the NPDES Program

EPA estimates that nationwide approximately 365,000 Applicators perform 5.6 million applications a year for the four use patterns covered under the PGP. EPA's general permit covers only six of the fifty states (plus many other smaller areas, such as most United States territories and Indian Country lands). EPA assumes approximately 10 percent of pesticide applications will occur in the areas covered under EPA's general permit based on the fact that approximately 10 percent of the population lives in these areas. The remaining 90 percent of pest control activities will occur in areas covered under state-issued NPDES permits. If each Applicator requires NPDES permit coverage, this represents an approximately 70 percent increase in the total number of NPDES permittees covered under the entire NPDES program (an increase from EPA's current estimate of 565,000 permittees annually to 930,000 permittees annually).

EPA recognizes that there are many site-specific situations which will determine whether a pesticide application operation needs permit coverage. EPA is not attempting to define all such situations in this Fact Sheet. Additionally, any pesticide application activities that do not fall within the four use patterns covered by this permit will require coverage under some other NPDES permit if those activities result in point source discharges to Waters of the United States. However, the Agency does want to make it clear that to the extent pesticide application operations need permit coverage, this permit is available for the four pesticide use categories. Thus, to the extent that a permit is needed for discharges from pesticide applications to rangelands, forestry, park lands, rights-of-way, wetlands and other areas, and the activity falls within one of the four use categories, coverage can be granted under this general permit.

Additionally, as described in Part I.6 of this fact sheet, the permit does not cover discharges that, by law, are not required to obtain NPDES permit coverage. Of note, the CWA specifically excludes from the definition of point source, "agricultural stormwater discharges and return flow from irrigated agriculture." Nothing in this permit changes the effect of those statutory exemptions.

EPA acknowledges that it has been difficult to derive definitive estimates of the number of activities actually conducted and potentially covered under the PGP and points to two main limitations of the available data. First, there is not a direct source of information on the number of Applicators and applications made for these pesticide use patterns. As a result, the estimates were derived from secondary sources of information, and generalizing assumptions were sometimes made. Second, the CWA does not define the terms "application" or "applicator" as it relates to discharges from pesticide applications. Thus, available data may not all use similar definitions of these terms. More detail, by pesticide use pattern, is provided in the economic analysis that is included in the administrative record for this permit.

1.1.2 Limitations on Coverage

1.1.2.1 Discharges to Water Quality Impaired Waters

Coverage under the PGP is only available with this general permit for certain discharges to impaired waters. Discharges to waters which are impaired for a substance which is not an active ingredient in that pesticide or a degradate of such an active ingredient are eligible for coverage. Discharges to waters impaired for temperature or some other indicator parameter, or for physical impairments such as "habitat alteration" are also eligible for PGP coverage, unless otherwise notified by EPA. Conversely, the permit is not available for the discharge of any pesticide to water that is impaired for a substance that is an active ingredient in that pesticide or a degradate of such an active ingredient. For example, application of the pesticide copper sulfate to a waterbody impaired for either copper or sulfates would not be eligible for coverage under this permit, because copper sulfate can degrade into these two substances. In this instance, the Operator would have to choose between obtaining coverage under an individual permit for such a discharge or selecting some other means of pest management, e.g., using mechanical means or a different pesticide active ingredient.

For this permit, EPA determined that it does not have information warranting a limitation for all impaired waters regardless of the impairment. In fact, the application of a pesticide to water in some instances actually improves the quality of the water, such as when used to control algae growth that can deplete oxygen levels in water. It is important to note that this permit allows EPA, based on additional information, to opt not to approve coverage under the PGP, or at a later date to require an Operator covered under the PGP to apply for coverage under an individual permit.

For purposes of this permit, impaired waters are those that have been identified by a State, Territory, Tribe, or EPA pursuant to Section 303(d) of the CWA as not meeting applicable water quality standards. Impaired waters for purposes of this permit include both waters with EPA-approved and EPA-established Total Maximum Daily Loads (TMDLs), and those for which EPA has not yet approved or established a TMDL. (A list of impaired waters, along with the pollutants or pollution identified as the cause of the impairment is available at www.epa.gov/owow/tmdl). While, it is EPA's opinion that the 303(d) list is not a final determination of impairments, it is the best available information and Operators should use it when deciding whether their discharges meet the eligibility requirements regarding waterbodies impaired for specific pesticides. Thus, these requirements will further ensure protection of water quality.

Also, several states have listed waters as impaired for "pesticides" but have not identified the specific pesticide for which the waterbody is impaired. Without additional information suggesting that the waterbody is impaired for a specific active ingredient or degradate of that active ingredient, EPA is providing coverage under this permit for discharges of pesticides to waters that are impaired generally for "pesticides." The Agency expects that as these impaired waters are further assessed, specific pesticides or classes of pesticides will be identified as the cause of the impairment, at which point dischargers will no longer be eligible to obtain permit coverage under the PGP for discharges of those named pesticide active ingredients or degradates of such. Additional discussion of existing impairments identified for which pesticides are identified as the source of the impairment is provided in Part III.3 of this fact sheet.

1.1.2.2 Discharges to Waters Designated as Tier 3 for Antidegradation Purposes

States and tribes provide the most stringent level of antidegradation protection, i.e., Tier 3 protection, to outstanding national resource waters. These waters are often regarded as the highest quality Waters of the United States, but the Tier 3 designation also provides special protection for waters of exceptional ecological significance, i.e., those which are important, unique, or sensitive ecologically. Except for certain temporary changes, Tier 3 protection means that water quality cannot be lowered in such waters. In broad terms, EPA's view of "temporary" is weeks and months, not years. States and tribes make the decision of which water bodies to designate as Tier 3. A list of Tier 3 waters in areas where the PGP is available can be accessed on the Internet at www.epa.gov/npdes/pesticides. EPA proposed in the draft PGP that Tier 3 waters not be eligible for coverage; rather, such discharges would be required to obtain coverage under an individual permit.

EPA received many comments on the draft permit indicating that time sensitive pesticide applications to Tier 3 waters are routinely performed and quick response is needed to preserve the outstanding quality of these Tier 3 waters and/or to protect public health near these waters. Several commenters stated that having to go through the more timely individual permit process would complicate the ability to control pests in a timely manner as is needed to minimize the environmental effects and costs of these pest problems. Several commenters noted that pesticides have been discharged to these waters for many years without negatively impacting those waters. In light of these comments, and in recognition of the fundamental purpose of water quality standards ("to protect the public health or welfare, enhance the quality of water and serve the purposes of this chapter," as stated in Section 303(c)(2) of the Clean Water Act), the final PGP provides permit coverage for discharges made to restore or maintain water quality or to protect public health or the environment that either do not degrade water quality or only degrade water quality on a short-term or temporary basis. This is consistent with EPA's longstanding view that "[s]tates may allow some limited activities which result in temporary and short-term changes in water quality. Such activities are considered to be consistent with the intent and purpose of [a Tier 3 water]." 48 FR 51400, 51403 (1983).

EPA is imposing additional documentation and reporting requirements for discharges to Tier 3 waters. See Part 5.1.2 of the permit. Any Decision-maker proposing to discharge to a Tier 3 water must submit a Notice of Intent consistent with Part 1.2.2 of the PGP. NOIs for such discharges are required to identify the Tier 3 water by name, and provide a discussion of the environmental problem and demonstration that the pesticide discharge is necessary to protect water quality, the environment, and/or public health. This NOI requirement includes the requirement for any Decision-maker already covered under the PGP who wants to discharge to a Tier 3 water at a later date, to submit an updated NOI containing the information identified above for discharges to Tier 3 waters. Additionally, NOIs for any discharges to Tier 3 waters must be submitted at least 10 days before beginning discharge unless discharges are in response to a Declared Pest Emergency Situation, in which case, an NOI is due for such discharges no later than 15 days after beginning discharge (if water contains NMFS Listed Resource of Concern) or 30 days after beginning discharge (if no NMFS Listed Resource of Concern). Discharges to Tier 3 waters are authorized for permit coverage through January 12, 2012 without submission of an NOI. For any discharges to Tier 3 waters after January 12, 2012, Decision-

makers are required to submit an NOI consistent with the earliest due date identified in Table 1-2 of the permit.

Of note, some States have adopted alternative approaches to designating Tier 2 or Tier 3 waters. These are collectively referred to as "Tier 2.5" waters since they fall between Tiers 2 and 3 in terms of characteristics and regulations supporting them. Tier 2.5 waters are commonly described as providing protection more stringent than Tier 2 but allowing some added flexibility that a Tier 3 water would not. Refer to Memorandum from William Diamond (Former Director, Standards and Applied Science Division) to Victoria Binetti (Chief, Region III, Program and Support Branch), June 13, 1991. Examples of Tier 2.5 waters exist in Massachusetts, which designates "outstanding resource waters" (ORWs). These waters have exceptional sociologic, recreational, ecological and/or aesthetic values and are subject to more stringent requirements under both the Massachusetts Water Quality Standards and the Massachusetts Stormwater Management Standards. ORWs include vernal pools certified by the Natural Heritage Program of the Massachusetts Department of Fisheries and Wildlife and Environmental Law Enforcement, all Class A designated public water supplies with their bordering vegetated wetlands, and other waters specifically designated. The PGP does not restrict eligibility for discharges to Tier 2.5 waters; rather, EPA expected States and Tribes to further limit such discharges as the States and Tribes deemed necessary through the CWA §401 certification process, the results of which are detailed in Part 9 of the general permit.

1.1.2.3 Discharges Currently or Previously Covered by another Permit

This Part of the PGP describes situations where an Operator is ineligible for coverage under this permit because of coverage under another permit. These include discharges currently covered under an NPDES permit and discharges from activities where the associated NPDES permit has been or is in the process of being denied, terminated, or revoked by EPA (although this last provision does not apply to the routine reissuance of permits every five years).

1.1.2.4 Endangered and Threatened Species and Critical Habitat Protection

As a result of consultation with NMFS EPA has added the following conditions to the permit to protect NMFS Listed Resources of Concern. Part 1.1.2.4.Part 1.1.2.4 requires the Operator to certify that they are eligible for permit coverage under one of the six criteria (A-F) as follows:

> **Criterion A.** Pesticide application activities will not result in a point source discharge to one or more Waters of the United States containing National Marine Fisheries Service (NMFS) Listed Resources of Concern, as defined in Appendix A, for this permit. In this case, no further certification is necessary. Decision-makers not otherwise required to submit an NOI are not required to do so merely to check Criterion A. However, Decision-makers who must submit an NOI anyway should check Criterion A if they do not discharge to a Water of the United States containing NMFS Listed Species of Concern.
>
> **Criterion B.** Pesticide application activities will discharge to one or more receiving Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A, but consultation with NMFS under section 7 of the ESA has been concluded for pesticide application activities covered under this permit. Consultations can be either

formal or informal, and would have occurred only as a result of a separate federal action. The consultation addressed the effects of pesticide discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and must have resulted in either:

i. A biological opinion from NMFS finding no likely jeopardy to listed species and no destruction/adverse modification of federally-designated critical habitat; or

ii. Written concurrence from NMFS with a finding that the pesticide discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated critical habitat.

Criterion C. Pesticide application activities will discharge to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A, but any "take" of these resources associated with such pesticide application activities has been authorized through NMFS' issuance of a permit under section 10 of the ESA, and such authorization addresses the effects of the pesticide discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. (The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. See Section 3 of the Endangered Species Act, 16 U.S.C. § 1532(19).)

Criterion D. Pesticide application activities were, or will be, discharged to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A, but only in response to a Declared Pest Emergency Situation. Decision-makers must provide EPA with their rationale supporting the determination whether the discharge is likely to adversely affect NMFS Listed Resources of Concern, including the description of appropriate measures to be undertaken to avoid or eliminate the likelihood of adverse effects.

Criterion E. Pesticide application activities for which permit coverage is being requested in the NOI will discharge to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A. Eligible discharges include those where the Decision-maker includes in the NOI written correspondence from NMFS that pesticide application activities performed consistent with appropriate measures will avoid or eliminate the likelihood of adverse effects. Eligibility under this criterion is contingent upon the Decision-maker following the measures described in correspondence from NMFS designed to avoid or eliminate the likelihood of adverse effects.

Criterion F. Pesticide application activities for which permit coverage is being requested in the NOI will discharge to one or more Waters of the United Stated containing NMFS Listed Resources of Concern, as defined in Appendix A. Eligible discharges include those from pesticide application activities that are demonstrated by the Decision-maker as not likely to adversely affect NMFS Listed Resources of Concern or that the pest poses a greater threat to the NMFS Listed Resources of Concern than does

the discharge of the pesticide. Decision-makers must provide EPA with their documentation demonstrating the basis for their finding.

Any Decision-maker proposing to discharge to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit, must submit a Notice of Intent consistent with Part 1.2.2 of the PGP. The specific requirements of the PGP NOI are identified in the NOI form provided in Appendix D of the permit. Also, refer to Appendix F of the PGP factsheet for the ESA Review Procedures to determine eligibility prior to submittal of the NOI. This NOI requirement includes the requirement for any Decision-maker already covered under the PGP who discharges to any Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit, that were not identified in a previously submitted NOI, to submit an updated NOI containing the information identified in Appendix D of the permit. Additionally, NOIs for any discharges to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit, must be submitted at least 30 days before beginning discharge. EPA may authorize certain discharges in less than 30 days, but no fewer than 10 days, for any discharges under Criterion B, C, or E of Part 1.1.2.4 of the permit (for which NMFS has already evaluated the effects of these discharges. Where eligibility is determined consistent with Criterion D, response to a Declared Pest Emergency Situation, an NOI is due for such discharges no later than 15 days after beginning discharge.

1.2 AUTHORIZATION TO DISCHARGE UNDER THIS PERMIT

1.2.1 How to Obtain Authorization

The NPDES general permit regulations, at 40 CFR §122.28(b)(2), require that Operators submit a Notice of Intent (NOI) to obtain coverage under an existing general permit for which that discharge is eligible. However, those regulations, at §122.28(b)(2)(v), provide that at the discretion of the Director (which, for the PGP, is EPA), certain discharges can be authorized under a general permit without submitting an NOI where EPA finds that an NOI would be inappropriate for such discharges. In making such a finding, EPA must consider the following criteria: the type of discharge; the expected nature of the discharge; the potential for toxic and conventional pollutants in the discharges; the expected volume of the discharges; other means of identifying discharges covered by the permit; and the estimated number of discharges to be covered by the permit. As described below, EPA is requiring submission of an NOI for certain discharges and is providing automatic coverage for certain other discharges for which EPA determined it would be inappropriate to require an NOI. EPA is exempting Operators of pesticide research and development activities from the need to submit an NOI because these activities are typically smaller and in many instances, are already covered under FIFRA's Section 5 (experimental use permits). Similarly, the permit exempts these activities from many requirements of the permit where such activities are inconsistent with the research plan.

As identified in Part III.1.1.1 of the fact sheet, EPA expects a large number of discharges from the application of pesticides spanning a wide range of Operators and activities will require NPDES permit coverage. EPA's consideration of the regulatory criteria in §122.28(b)(2)(v) is as follows:

Type and expected nature of discharge

All discharges authorized by this general permit involve either (1) applications made directly to or over Waters of the United States to control pests in or over the water, or (2) applications to control pests near water such that pesticides will be unavoidably deposited into Waters of the United States. The general permit is structured by pesticide use patterns. These use patterns were developed to include discharges that are similar in type and nature, and therefore represent the type of discharges and expected nature of the discharges covered under this permit. The general permit covers the four use patterns described in Part III.1.1. EPA evaluated each use pattern independently with the goal of identifying the significant activities resulting in discharges that should be covered under this PGP.

Potential for toxic and conventional pollutants in the discharge

EPA does not expect the potential for toxic and conventional pollutants in the discharges from pesticides to vary among use patterns. EPA would expect, however, that the potential for impacts from high concentrations of toxic or conventional pollutants in the discharge would be smaller when fewer acres or linear feet are treated.

Expected volume of discharge

EPA also considered the expected volume of discharges from each use pattern. It is difficult to estimate the expected volume of discharges for each use pattern because Pest Management Measures used by Operators to meet the permit's technology based effluent limitations may vary based on site-specific conditions. For example, the volume of the discharge may vary depending on the specific pesticide being used, the intensity of the pest pressure based on the specific pest problem, and the pest management strategy deemed to be most effective for the pest problem. Moreover, minimizing the discharge of pesticide product necessary to manage pests successfully will vary among Operators depending on which Pest Management Measures the Operator uses. Nonetheless, EPA expects that, in general, the volume of the discharge will vary proportionally with the number of acres and linear miles treated. Therefore, for all use patterns, EPA expects that the volume of the discharge for a given pesticide application will be lower when fewer acres or linear feet are treated over a calendar year. Moreover, while there may be more Operators applying pesticides to small treatments areas when compared to Operators applying to large treatment areas, the volume of discharges from Operators applying to small treatment areas is believed to be substantially less on a per applicator basis and cumulatively less than the volume of discharges from applications made by Operators applying to large treatment areas.

Other means to identify discharges

EPA also considered other means of identifying types of discharges covered by this permit. EPA may be able to identify pesticide discharges from Operator-submitted data, ambient water sampling data, and other information submitted by pesticide dischargers pursuant to federal or state law. However, EPA recognizes that the availability and quality of these data may be limited and highly variable across the scope of activities and areas covered under the PGP.

Number of discharges

Lastly, EPA considered the estimated number of discharges to be covered by the permit. While the exact number of entities and thus the number of discharges which may be covered by the permit is unknown, EPA estimates that the PGP covers more than 35,000 dischargers per year in the states for which EPA is the permitting authority. Of this total, a large majority represent dischargers performing small pesticide applications that EPA considers to have very low

potential for impact (such as herbicide applications to short sections of ditches or canal banks). Thus, requiring an NOI from all dischargers would be a large burden of little value for permitting authorities and permittees alike. Also, EPA received many comments that indicated For-Hire Applicators apply to many small areas throughout different pest management areas, and requiring an NOI from them for certain activities would be duplicative of Decision-maker requirements. This would likely confuse For-Hire Applicators who are generally very small businesses, and would not provide meaningful information on identification of pest management areas.

In analyzing these regulatory criteria, the Agency gave particular weight to the expected volume of the discharges and the estimated number of discharges to be covered by the permit. After considering the universe of entities to be covered under the permit, EPA found a logical break between entities applying pesticides to larger areas versus smaller areas, and a difference between the types of entities generally responsible for performing such pest control activities. As a result, NOI requirements are based on the size of areas treated and the entity making the decision to perform pesticide applications. In addition, EPA identified a need for additional information for any discharges to outstanding national resource waters (Tier 3 waters) and to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit, and is including NOI requirements for all discharges to these waters as well.

1.2.2 Decision-makers Required to Submit an NOI

To obtain authorization under the PGP, Operators must meet the Part 1.1 eligibility requirements, and only if required by Part 1.2.2, also submit a complete and accurate NOI no later than the appropriate deadline described in Part 1.2.3. Decision-makers who are required to submit an NOI, but are discharging between October 31, 2011 and January 12, 2012, must begin complying with Part 2.2 requirements as of October 31. 2011.

Table 1-1 in Part 1.2.2 of the permit identifies which Decision-makers are or will be required to submit an NOI. Based on the analysis outlined in Part 1.2.1 above, EPA has determined that it is inappropriate to require For-Hire Applicators, who are not Decision-makers as defined in Appendix A of the permit, to submit NOIs. EPA has further determined that Decision-makers who apply pesticides to relatively small areas should not be required to submit NOIs. Therefore, EPA is exercising its discretion and not requiring these Operators to submit NOIs (except for certain Operators that the Agency believes have a significant role in pest control for public health and environmental protection and should be expected to provide Agency notice of such activities). Nonetheless, EPA emphasizes that even if an NOI is not required, these Operators are covered automatically under this permit and are still subject to all applicable requirements contained within the permit. EPA is requiring NOIs from the following types of Decision-makers:

- Decision-makers exceeding an annual treatment area threshold;
- Other Decision-makers specifically in the business of pest control;
- Decision-makers discharging to Tier 3 waters; and
- Decision-makers discharging to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit.

A more detailed discussion of EPA's rationale for requiring NOIs for these three categories of Decision-makers follows.

NOIs for Decision-Makers Exceeding an Annual Treatment Area Threshold

EPA developed annual treatment area thresholds for each use pattern that will only require larger Operators applying pesticides to larger areas to submit an NOI. To determine the appropriate annual treatment area thresholds that would trigger the NOI requirement, EPA's Office of Water, Office of Chemical Safety and Pollution Prevention (formerly the Office of Pesticides, Pollution, and Toxic Substances) and the ten EPA Regional Offices engaged in discussions with USDA, states as co-regulators, and representatives from industry including pesticide registrants, applicators, and land managers. EPA also solicited and received some comments on the draft PGP on appropriate threshold values to use for NOI submission. Based on these discussions, the comments received, and EPA's best professional judgment, EPA developed annual treatment area thresholds that establish NOI requirements for applications to larger areas, which are believed to have the greatest potential for impact to Waters of the United States. EPA recognizes there are many unknowns concerning the size, organization, and activities of the permitted universe. Considerable variation in the availability of data and in the consistency of requirements across regions and states resulted in EPA relying heavily on its best professional judgment in setting the NOI annual treatment area thresholds for each of the use patterns. If a Decision-maker, otherwise not required to submit an NOI, anticipates it will exceed an applicable annual treatment area threshold during any time in a given calendar year of the permit cycle, that Decision-maker must then submit an NOI consistent with the due dates described in Part 1.2.3.

When calculating the size of the treatment area for comparing to an annual treatment area threshold, EPA uses the term "at water's edge adjacent to Waters of the United States" to identify those areas where pesticides are applied to control pests that are present near water where a portion of the pesticides will unavoidably be deposited to the water to target the pests. EPA's use of the word "adjacent" in identifying these areas is merely used to identify areas near Waters of the United States and is not intended to mean "adjacent" as defined in regulation for use when defining the term "Waters of the United States."

To avoid duplication of submission, EPA is requiring that the Decision-maker responsible for such applications be the Operator required to submit the NOI. So, where a Decision-maker hires an Applicator to perform the pest control activities, the NOI is to be submitted by the Decision-maker.

EPA's rationale for the annual treatment area threshold and Decision-makers required to submit NOIs for each use pattern is as follows:

Mosquito Control and Other Flying Insect Pest Control

For Mosquitoes and Other Flying Insect Pests, the annual treatment area threshold has been set at 6,400 acres. EPA believes that the vast majority of mosquito control and abatement districts in the United States manage areas significantly larger than this threshold and may reasonably expect to exceed it during any given year. For instance, information from the state of Florida on 49 independent mosquito control districts shows that 48 of the 49 districts annually apply to more than 6,400 acres, which indicates that applications exceeding this area are quite typical. Similarly, data provided in EPA's draft

Economic Achievability Analysis of the Pesticide General Permit (PGP) for Point Source Discharges from the Application of Pesticides and included in the administrative record for this permit show similar findings as for Florida. Furthermore, the effective control of other aquatic breeding, flying insects, such as the blackfly, necessitates applications that approach or exceed this threshold. Therefore, EPA believes the threshold appropriately captures most Decision-makers engaging in this use pattern. EPA also believes too that even those mosquito control districts that treat areas below the threshold should be required to submit NOIs, as these entities were created specifically for the control of pests and should provide notice to the Agency of their activities. As such, the permit requires all mosquito control districts or similar pest control districts, as well as any other Decision-makers treating over the annual treatment area threshold, to submit an NOI. The Agency believes this appropriately captures those two classes of entities that either (1) are established with a specific purpose of pest control or that (2) treat large enough areas to warrant notice to the Agency.

Weed and Algae Control

For Weeds and Algae, the annual treatment area threshold has been set at 80 acres or 20 linear miles of pesticide application to canals and other Waters of the United States. This threshold has been set to capture Decision-makers treating relatively large portions of surface waters and watersheds, such as water management districts, wildlife and game departments, and some homeowner and lake associations. For example, Florida's South Florida Water Management District usually applies pesticides to 60 acres at a time hundreds of times per year for various invasive plants on Florida's Lake Okeechobee. After reviewing the operations of major irrigation and flood control systems, EPA expects that generally, relatively large entities such as South Florida Water Management District, California Department of Water Resources, or organizations with comparable resources are the types of entities that manage 20 or more miles of engineered irrigation systems, and that this is a reasonable limit to trigger the NOI requirement. The same rationale is applied to managers of ditch and canal banks. Therefore, EPA believes the threshold appropriately captures the relatively large applications but excludes a significant number of small applications. Similar to mosquito control, EPA believes that weed control districts, or similar pest control districts created specifically for the control of pests that treat areas below the threshold should be required to submit NOIs. As such, the permit requires all weed control districts or similar pest control districts as well as any other Decision-makers treating over the annual treatment area threshold to submit an NOI. The Agency believes this appropriately captures those two classes of entities that either (1) are established with a specific purpose of pest control or that (2) treat large enough areas to warrant notice to the Agency.

Animal Pest Control

Invasive and nuisance aquatic animals are most commonly treated by public agencies such as departments of fish and game, or utilities such as water management districts that manage areas of surface water in excess of 80 acres or 20 linear miles. The high mobility and prolific breeding abilities that necessitate control of aquatic animals usually means that pesticide applications most often occurs in the entirety or large portions of the water bodies they inhabit. For example, fishery management applications using rotenone often occur in the entire lake and thus, any similar application to a lake of more than 80 acres in area will trigger the annual treatment area threshold. EPA expects that for this reason,

only spot applications to eradicate small emergent populations of sessile animals or applications to very small water bodies might be excluded from an NOI requirement. Therefore, EPA believes the threshold appropriately captures the relatively large Decision-makers engaging in this use pattern.

Forest Canopy Pest Control
Forest canopy pest suppression programs are designed to blanket large tracts of terrain, throughout which Operators may not be able to see Waters of the United States beneath the canopy. EPA has set the annual treatment area threshold at 6,400 acres for this use pattern with the understanding that this will exclude only the smallest applications from the NOI requirement. These smaller applications generally occur on private lands. Therefore, EPA believes the threshold appropriately captures most Decision-makers engaging in this use pattern, particularly public agencies managing large tracts of land.

NOIs for Certain Entities Regardless of the Annual Treatment Area Threshold

In addition to NOIs from Decision-makers treating the largest areas, EPA is also requiring NOIs from certain other types of entities with land resource stewardship responsibilities that involve the routine control of pests. For these entities, the permit requires NOIs regardless of the size of the area treated. In general, EPA expects that in many instances these entities will exceed one or more of the annual treatment area thresholds. Nonetheless, the Agency believes that regardless of the size of the treatment area, any Agency for which pest management for land resource stewardship is an integral part of the organization's operations should also be required to submit NOIs. Such entities may include Federal government agencies such as USDA forest Service and DOI Bureau of Land Management, or state government agencies such as departments of natural resources. EPA's rationale for imposing the NOI requirement is premised on these entities (public, quasi-public, and private) having as an integral responsibility controlling pests. The specific entities required to submit NOIs regardless of whether an annual treatment area threshold is exceeded are as follows:

Any Agency for which pest management for land resource stewardship is an integral part of the organization's operations – Any agency that has pest control as an integral part of the organization's operations or responsibilities is required to submit an NOI. EPA believes that many pest control activities performed by these entities will meet or exceed the threshold requirement to submit an NOI. Even when these activities do not exceed the thresholds, however, they are subject to the NOI requirement if the pesticide application is an integral part of their operations and responsibilities. EPA also recognizes, however, that some of these agencies may perform ad-hoc pest control on a small-scale that is not an integral part of the organization's operations but rather incidental, for example, to its occupancy of a building. As an example, the U.S. Social Security Administration may maintain a building or group of buildings where weeds have overtaken a parking lot that is adjacent to a lake, and the local office decides to control those weeds with an herbicide. That weed control activity would not be considered an integral part of the Social Security Administration operations but rather the weed control would be incidental to operation of the facility. By contrast, state agencies such as a department of natural resources and federal agencies such as the US Forest Service, would have pest control as an integral part of their organization's operations and as such would be required to submit an NOI. To be clear, in all instances described above, discharges would require permit coverage; however, the requirement to submit an NOI

applies only to those pest control activities that are integral to an organization's operations and responsibilities.

Mosquito control districts (or similar pest control districts, such as vector control districts) – In many parts of the country, state and territorial governments have established special districts for the purpose of mosquito control. Generally, these districts treat large areas that would exceed EPA's annual treatment area thresholds; however EPA is requiring any such district, regardless of the area treated, to submit an NOI.

Irrigation control districts (or other similar public or private entities supplying irrigation waters) – In many parts of the country, special districts have been established for the purpose of maintaining irrigation canals and ditches. Generally, these districts treat large areas that exceed EPA's annual treatment area thresholds; however EPA is requiring any such district, regardless of the area treated, to submit an NOI.

Weed control districts (or other similar special purpose districts created with a responsibility of pest control) – EPA is aware of some weed control districts created across the country with the specific responsibility to control pests. The Agency has determined that these types of entities, who perform pest management and control, as the primary function of their organization, should provide notice to the Agency of such activities regardless of the size of the area treated.

<u>NOIs for Discharges to Tier 3 Waters</u>

Any Decision-maker requesting to discharge to Tier 3 waters may seek coverage under the PGP provided that the discharge is short-term or temporarily lowers water quality due to pesticide applications that are necessary to protect the water quality, environment, or public health. Any Decision-maker wanting coverage under the PGP for such a discharge will be required to identify the Tier 3 water by name with authorization to discharge to Tier 3 waters limited to only such named waters.

<u>NOIs for Discharges to Waters of the United States Containing NMFS Listed Resources of Concern, as Defined in Appendix A of the Permit</u>

Any Decision-maker with any discharges to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit, may seek coverage under the PGP by submitting a complete and accurate NOI form that includes certifying eligibility under one of the five criteria (B-F) in Part 1.1.2.4 of the permit.

Contents of the NOI

Pursuant to 40 CFR §122.28(b)(2)(ii), the contents of any NOI must be specified in the general permit and require the submission of information necessary for adequate program implementation, including at a minimum:

- the legal name and address of the Owner or Operator,
- the facility name and address,
- type of facility or discharges,
- the receiving stream(s), and
- signed in accordance with §122.22.

The specific requirements of the PGP NOI are identified in the NOI form provided in Appendix A of the permit but include those elements identified in the regulations described above with three additional data elements that EPA believes are important to fully characterize the activities for which permit coverage is being provided, namely identification of:

- pesticide use activities that trigger the PGP requirements to develop a pesticide discharge management plan and submit an annual report;
- impaired water(s) and/or Tier 3 water(s) for which permit coverage is being requested for discharges to these waters and demonstration of eligibility for such discharges; and
- whether pesticide discharges will be to Waters of the United States containing NMFS Listed Resources of Concern, and, if so, what pest(s) are to be controlled; the pesticide product(s) to be discharged; the planned quantity and rate of discharge(s); the number of planned discharges; and signed certification by the Decision-maker that one of the six criteria in Part 1.1.2.4 have been met. EPA recognizes the implementation of pest management measures as specified in the permit may involve a degree of "adaptive management" such that exact timing and quantities of applications cannot be determined in advance for the duration of the permit. EPA expects the Decision-maker to provide the required information to the extent feasible and consistent with the implementation of the selected pest management measures.

Also, the NOI form requires Decision-makers to submit changes to previous NOI forms where, for example, coverage for an additional discharge not included in the original NOI is being requested. EPA expects these NOI change requests to be submitted primarily in four instances: (1) coverage for a new or expanded pest management area or a new pesticide use pattern is being requested, (2) discharge to a not-previously identified Tier 3 water is identified for permit coverage, or (3) discharge to any not-previously identified Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit, is being requested or (4) changes in the treatment area, pesticide product, method or rate of application, or approximate dates of applications for discharges to Waters of the United States containing NMFS Listed Resources of Concern. In cases where this information was previously provided to the extent feasible and consistent with the implementation of selected pest management practices, a revised NOI is not required as long as the discharge continues to be consistent with the information provided in the original NOI submission. In these four instances, Decision-makers are required to submit revised NOIs that reflect changes in the areas and types of activities for which coverage is being requested.

1.2.3 Discharge Authorization Date

The PGP is effective on October 31, 2011. Eligible discharges are covered under this permit automatically, without submission of an NOI, from the effective date of this permit through January 12, 2012. Decision-makers required to submit NOIs, as detailed in Part 1.2.2, are authorized consistent with the timeframes and provisions detailed in Part 1.2.3 of the permit. EPA is not requiring NOIs be submitted for any discharges that occur on or before January 12, 2012 to allow Decision-makers enough time to read and understand the permit requirements and comply with the recordkeeping and reporting requirements of the permit. Decision-makers who are required to submit an NOI, but are discharging between October 31, 2011 and January 12, 2012, must begin complying with Part 2.2 requirements as of October 31. 2011.

For any discharges occurring after January 12, 2012 for which Operators are not required to submit an NOI, permit coverage continues uninterrupted. For any discharges occurring after January 12, 2012, NOIs are required from Decision-makers according to the schedule detailed in Table 1-2 in the final PGP and as described below:

- Other than for discharges in response to a Declared Pest Emergency Situation or that are to NMFS Listed Resources of Concern, both of which are described below, Decision-makers who discharge after January 12, 2012 are authorized 10 days after EPA posts on its public Internet website at www.epa.gov/npdes/pesticides receipt of a complete and accurate NOI unless EPA places a hold on the authorization. The Agency may place an authorization on hold (i.e., delay authorization) if the Agency determines, including based on information provided by other interested parties, that the Operator may not be eligible for PGP coverage. Thus, for any discharges commencing on or before January 12, 2012 for which continuing coverage is needed after that date, an NOI will need to be submitted no later than January 2, 2012 to ensure uninterrupted permit coverage, and for any discharges beginning after January 12, 2012 no later than 10 days before the first discharge.

- Any Decision-maker that discharges in response to a Declared Pest Emergency Situation, as defined in Appendix A of the permit, that is not to Waters of the United States containing NMFS Listed Resources of Concern, for which that activity triggers the requirement to submit an NOI, is authorized to discharge immediately; however, a complete and accurate NOI is required to be submitted no later than 30 days after beginning to discharge (for any related discharges after January 12, 2012). This delay in NOI submission and immediate authorization is to allow pest managers the opportunity to respond to pest emergencies without delay.

- In any Declared Pest Emergency Situation for discharges to Waters of the United States containing NMFS Listed Resources of Concern, the discharges are authorized for 60 days or until EPA determines that the discharges may not continue (or places additional conditions on the discharge) due to concerns related to compliance with the ESA-related conditions of this permit. These Decision-makers must file an NOI no later than 15 days after beginning to discharge. The NOI must identify:

    1. The location of the pest management area in detail or include a map of the location;
    2. Pest(s) to be controlled;
    3. Pesticide product(s) to be discharged and method of application;
    4. Planned quantity and rate of discharge(s) for each method of application;
    5. Number of planned discharges;
    6. Approximate date(s) of planned discharge(s); and
    7. The rational supporting whether the discharge is likely to adversely affect a NMFS Listed Resource of Concern, including the description of appropriate measures to be undertaken to avoid or eliminate the likelihood of adverse effects.

For discharges that have already occurred prior to NOI submission, items 1 through 6 above must also be identified in that NOI.

In any Declared Pest Emergency Situation in areas with Waters of the United States containing NMFS Listed Resources of Concern, NMFS will have 30 days after submission of an NOI to provide EPA with a determination as to whether NMFS believes the eligibility criteria of "not likely to adversely affect listed species or designated critical habitat" has been met, could be met with conditions that NMFS identifies, or has not been met. EPA expects to rely on NMFS' determination in deciding whether to disallow continued permit coverage or if additional conditions are necessary. If NMFS does not provide EPA with a recommendation within 30 days of EPA posting on the Internet receipt of a complete and accurate NOI, authorization for these discharges will continue. If EPA identifies additional permit conditions, or includes additional permit conditions recommended by NMFS, as necessary to qualify discharges as eligible for coverage beyond 60 days under the PGP, those conditions remain in effect for the life of the permit. EPA will advise the Decision-maker within 15 days of receiving a determination from NMFS whether the discharge or discharges qualify for coverage beyond the 60-day authorization provided under the PGP. If the decision maker does not hear from EPA, the decision maker may assume that permit authorization continues unless notified otherwise. EPA believes this approach provides a reasonable amount of time for Operators to quickly respond to any Declared Pest Emergency Situation (i.e., 60 days after beginning to discharge), yet provides the Agency with an opportunity to ensure that subsequent discharges are controlled as necessary to protect water quality and any NMFS Listed Resources of Concern.

- For any discharges commencing on or before January 12, 2012 to Waters of the Unites States containing NMFS Listed Resources of Concern for which continuing coverage is needed after that date, an NOI will need to be submitted no later than December 12, 2012 to ensure uninterrupted permit coverage, and for any discharges beginning after January 12, 2012 no later than 30 days before the first discharge. EPA may, of course, place a hold on such authorization. This 30-day timeframe operates similar to the 10-day timeframe described above but provides more time for interested parties (including the Services) to review information prior to EPA authorizing discharges under the PGP. This additional timeframe reflects NMFS' interest in having sufficient time to review NOI submissions as a result of discharges to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit. EPA strongly recommends Decision-makers submit NOIs as early as possible for activities that discharge to Waters of the United States containing NMFS Listed Resources of Concern. It is important that the fullest possible opportunity be given for consideration of any effects that an application may have on listed species. The permit includes a 30-day waiting period after submittal of an NOI to provide an opportunity for NMFS and other interested stakeholders to review the NOI. Also during this time period, issues can be raised with EPA. EPA may authorize certain discharges in less than 30 days, but no fewer than 10 days, after submission of an NOI for any discharges under Criterion B, C, or E of Part 1.1.2.4 of the permit. This is because under criteria B and C, Operators would have already consulted with NMFS and under criterion E, the Operator would have received a

written letter from NMFS that the discharge will not adversely affect NMFS Listed Resources of Concern. The Agency may determine that a Decision-maker is ineligible for coverage under the PGP and deny coverage. However, the Agency is concerned that if a large number of NOIs with discharges to Waters of the United States containing NMFS Listed Resources of Concern are submitted to EPA around the same time, it will make it difficult to fully consider the contents of each NOI of interest. Early submittal and review of NOIs will help ensure that any issues are addressed and resolved in a timely manner so that appropriate pesticide applications can proceed as planned. In determining whether to withhold permit authorization under this permit, EPA expects to rely on NMFS expertise in making a determination as to whether there is likely to be adverse effect. Within 30 days after EPA posts on the Internet receipt of a complete and accurate NOI, for those discharges to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A, NMFS will provide EPA with a determination as to whether it believes the eligibility criteria of "not likely to adversely affect listed species or designated critical habitat" has been met, could be met with conditions the NMFS identifies, or has not been met. EPA expects to rely on NMFS' determination in deciding whether to disallow continued permit coverage or if additional conditions are necessary. EPA notes that it is also advantageous to the Decision-maker to work with NMFS prior to submitting the NOI, and to obtain written correspondence from NMFS, if possible, that pesticide application activities performed consistent with appropriate measures will avoid or eliminate the likelihood of adverse effects. In this case, as noted above, EPA may authorize discharges in as few as 10 days after the NOI is submitted, although the operator may not assume authorization before 30 days unless specifically so notified by EPA.

NOIs submitted electronically will be posted on the NPDES website instantaneously with the Operator authorized to discharge 10 or 30 days after the posting, providing EPA does not place a hold on the authorization for that NOI. EPA will send automatic confirmation of receipt of NOIs and of discharge authorization.

The PGP contains standard language that provides EPA with the authority to modify permit terms or terminate permit coverage as appropriate. NMFS and any other interested persons may provide information to EPA noting any concerns with authorized discharges, including those resulting from Declared Pest Emergency Situations. EPA will consider that information and take future action as appropriate. As provided in the permit, in general, EPA may take the following actions:

Part 1.3 - Require Operators to apply for and/or obtain authorization to discharge under either an NPDES individual permit or an alternative NPDES general permit.

Appendix B, Part B.1 - Terminate, revoke and reissue, or modify a permit for any permit noncompliance, that is also grounds for enforcement action.

Part 1.2.3; Part 6.3; Appendix B, Part B.6 - Modify, revoke and reissue, or terminate a permit for cause.

1.2.4 Continuation of this Permit.

If this permit is not reissued or replaced (or revoked or terminated) prior to its expiration date, existing dischargers are covered under an administrative continuance, in accordance with 40 CFR § 122.6. If coverage is provided to an Operator prior to the expiration date of this permit, the Operator is authorized to discharge under this permit until the earliest of:

(a) Your authorization for coverage under a reissued permit or a replacement of this permit following your timely and appropriate submittal of a complete NOI (if required) requesting authorization to discharge under the new permit and compliance with the requirements of the NOI (if you are below the NOI threshold, your authorization is automatically extended until you are covered under a revised or replacement permit);

(b) The processing and posting of your Notice of Termination consistent with Part 1.2.5.1;

(c) The issuance or denial of an individual permit for a discharge resulting from application of a pesticide that would otherwise be covered under this permit;

(d) A formal permit decision by EPA not to reissue this general permit, at which time EPA will identify a reasonable time period for covered dischargers to seek coverage under an alternative general permit or an individual permit. Coverage under this permit will cease when coverage under another permit is granted/authorized; or

(e) EPA has informed you that you are no longer covered under this permit.

Where EPA fails to issue a final general permit prior to the expiration of a previous general permit, EPA has the authority to administratively extend the permit for Operators authorized to discharge under the prior general permit. However, EPA does not have the authority to provide coverage under an administratively extended permit to entities not authorized prior to the expiration date of the permit.

1.2.5 Terminating Coverage

1.2.5.1 Submitting a Notice of Termination.

The permit recommends Decision-makers use the eNOI system to file Notices of Termination. To terminate coverage under this permit, any Decision-maker that submitted a Notice of Intent to obtain permit coverage is required to submit a Notice of Termination in accordance with information identified in Appendix E. The Decision-maker's authorization to discharge under the permit terminates at midnight of the day that a complete Notice of Termination is processed and posted on EPA's website (www.epa.gov/npdes/eNOI). Dischargers automatically covered under this permit as identified in Part 1.2.3 are automatically terminated upon permanent cessation of discharge consistent with any of the criteria identified in Part 1.2.5.2.

EPA requires Decision-makers to file a Notice of Termination to notify EPA that its obligation to manage pesticide discharges is no longer necessary for one of the EPA-approved reasons (as described in Part 1.2.5.2). If EPA determines that the Decision-makers has not satisfied one of the conditions in Part 1.2.5.2 for being able to submit a Notice of Termination

(e.g., the Decision-maker continues to have a discharge), then the notice is not valid and the Decision-maker must continue to comply with the conditions of the permit. Likewise, if EPA determines that the Notice of Termination is incomplete, the Decision-maker may be found to be in violation of reporting requirements under Section 308 of the CWA.

1.2.5.2 When to Submit a Notice of Termination.

Once all point source discharges associated with pesticide application have ceased, the Decision-maker must submit a Notice of Termination, as described in Part 1.2.5.1, within 30 days after one or more of the following conditions have been met: (1) a new Decision-maker has taken over responsibility for the pest control activities; (2) all discharges have ceased from the application of pesticides for which permit coverage was obtained and discharges are not expected during the remainder of the permit term for any of the use patterns as identified in Part 1.1.1, or (3) coverage under an individual permit or alternative general permit has been obtained for all discharges required to be covered by an NPDES permit, unless coverage was obtained consistent with Part 1.3, in which case, coverage under this permit will terminate automatically.

EPA is requiring a Notice of Termination from Operators that on their own switch to a different permit to provide the Agency with clear notice that the Operator's discharge is not covered under two NPDES permits. Operators that terminate coverage based on an EPA request consistent with Part 1.3 are not required to submit a Notice of Termination.

1.2.5.3 Termination for Operators not Required to Submit an NOI.

Operators covered under this permit that are not required to submit an NOI are terminated from permit coverage when there is no longer a discharge from the application of pesticides or the discharges are covered under an NPDES individual permit or alternative NPDES general permit. Operators not required to submit an NOI are also not required to submit an NOT.

1.3. Alternative Permits

1.3.1 Requirements for Coverage under an Alternative Permit

EPA may require an individual permit (in accordance with 40 CFR 122.28(b)(3)(ii)) or coverage under an alternative NPDES general permit instead of the PGP. The regulations also provide that any interested party may petition EPA to take such an action. The issuance of the individual permit or alternative NPDES general permit is in accordance with 40 CFR Part 124 and provides for public comment and appeal of any final permit decision. The circumstances in which such an action would be taken are set forth at 40 CFR 122.28(b)(3). EPA notes that discharges from anti-foulant hull coatings, biofouling prevention, and residuals from ballast water treatment technologies are already covered under the Vessels General Permit and do not require coverage under this general permit (see EPA NPDES Vessels General Permit at http://www.epa.gov/NPDES/vessels).

1.3.2 Operator Requesting Coverage under an Alternative Permit

After being covered by this permit, the Operator may request to be excluded from such coverage by applying for an individual permit or alternative NPDES general permit. In this case, the Operator must submit an individual permit application in accordance with 40 CFR 122.28(b)(3)(iii), along with a statement of reasons supporting the request, to EPA at the applicable EPA Regional Office listed in Part 8.2 of the PGP. The request may be granted by issuance of an individual permit or authorization of coverage under an alternative general permit if the reasons are adequate to support the request. Under this scenario, if an individual permit is issued, or authorization to discharge under an alternative general permit is granted, coverage under this permit is automatically terminated under 40 CFR 122.28(b)(3)(iv) on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit.

Part 1.3.2 of the permit reminds Operators of their ability to apply for coverage under an individual permit in lieu of coverage under this general permit and describes the steps to take to be excluded from this permit after being authorized under this permit. Cases where an individual NPDES permit may be required are described fully in 122.28(b)(3)(iii). The following are the pertinent situations for this permit where an individual permit may be necessary:

a) A Water Quality Management plan containing requirements applicable to such point sources is approved;
b) Circumstances have changed since the time of the request to be covered so that the discharger is no longer appropriately controlled under the general permit, or either a temporary or permanent reduction or elimination of the authorized discharge is necessary; or
c) The discharge(s) is a significant contributor of pollutants. In making this determination, EPA may consider the following factors:
   (1) The location of the discharge with respect to Waters of the United States;
   (2) The size of the discharge;
   (3) The quantity and nature of the pollutants discharged to Waters of the United States; and
   (4) Other relevant factors.

EPA may require an Operator to apply for an individual permit only if EPA notifies the Operator in writing that a permit application is required. This notice must include a brief statement of the reasons for this decision, an application form, a statement setting a time for the Operator to file the application, and a statement that on the effective date of the individual NPDES permit the general permit as it applies to the individual Operator shall automatically terminate. EPA may grant additional time upon request of the applicant.

When an individual NPDES permit is issued to an Operator otherwise subject to a general NPDES permit, the applicability of the general permit to the individual NPDES Operator is automatically terminated on the effective date of the individual permit.

Note that an individual permit is required for discharges from the application of pesticides to waters where such waters are impaired by a substance which either is an active

ingredient in that pesticide or is a degradate of such an active ingredient, and for certain applications of pesticides to Tier 3 waters where such applications are not made to restore or maintain water quality or to protect public health or the environment in such a way that they either do not degrade water quality or only degrade water quality on a short-term or temporary basis. In these cases, authorization under this general permit would not have been available in the first place.

1.4. Severability

Invalidation of a portion of this permit does not necessarily render the whole permit invalid. EPA's intent is that the permit remains in effect to the extent possible; in the event any part of this permit is invalidated, EPA will advise the regulated community as to the effect of such invalidation.

1.5 Other Federal and State Laws

Part 1.5 of this permit includes the following language: "Operators must comply with all other applicable federal and state laws and regulations that pertain to the application of pesticides. For example, this permit does not negate the requirements under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and its implementing regulations to use registered pesticides consistent with the product's labeling. In fact, applications in violation of certain FIFRA requirements could also be a violation of the permit and therefore a violation of the CWA (e.g. exceeding label application rates). Additionally, other laws and regulations might apply to certain activities that are also covered under this permit (e.g., United States Coast Guard regulations)."

This part of the permit is intended to clarify that Operators are still required to comply with other applicable laws, and that merely complying with the conditions of this permit may not meet all regulations applicable to the types of activities covered under this permit. In fact, compliance with permit terms, in some instances, establishes an expectation that Operators will comply with other laws to demonstrate compliance with this permit. For example, the permit requires Operators to use "Pest Management Measures" to "minimize" discharges. As these terms are defined in Appendix A of the permit, Operators must use practices that comply with, among other things, "relevant legal requirements" to reduce and/or eliminate pesticide discharges to Waters of the United States.

1.6 Federally Listed Endangered and Threatened Species and Designated Critical Habitat.

This part of the permit clarifies that Operators are required to comply with conditions and/or requirements for discharges to Waters of the United States from any Section 7 consultation or Section 10 permit for pesticides application activities covered under this permit.

2. EFFLUENT LIMITATIONS

Background

The Clean Water Act (CWA) requires that all point source discharges from existing facilities, or in this case, pesticide applications, meet technology-based effluent limitations[2] representing the applicable levels of necessary control. Additionally, water quality-based effluent limitations (WQBELs) are required by CWA Section 301(b)(1)(C) as necessary where the technology-based effluent limitations are not sufficient to protect applicable water quality standards. See *P.U.D. No. 1 of Jefferson County et. al. v. Washington Department of Ecology*, 511 U.S. 700 (704) 1994. Water quality-based requirements will be discussed in greater depth in Section III.3 of the fact sheet. The technology-based effluent limitations contained in the PGP are non-numeric and constitute the levels of control that reduce the area and duration of impacts caused by the discharge of pesticides to Waters of the United States. In addition, these effluent limitations provide for protection of water quality standards, including protection of beneficial uses of the receiving waters following completion of pest management activities.

The Clean Water Act Requires EPA to Develop Effluent Limitations that Represent the Following:

Best Practicable Control Technology Currently Available (BPT)

The CWA requires BPT effluent limitations for conventional, toxic, and non-conventional pollutants. Section 304(a)(4) designates the following as conventional pollutants: biochemical oxygen demand (BOD5), total suspended solids, fecal coliform, pH, and any additional pollutants defined by the Administrator as conventional. The Administrator designated oil and grease as an additional conventional pollutant on July 30, 1979. 40 CFR 401.16. EPA has identified 65 pollutants and classes of pollutants as toxic pollutants, of which 126 specific substances have been designated priority toxic pollutants. 40 CFR 401.15 and 40 CFR Part 423 Appendix A. All other pollutants are considered to be non-conventional.

In specifying BPT, under CWA section 301(b)(1)(A); 304(b)(1)(B); 40 CFR 125.3(d)(1), EPA looks at a number of factors. EPA first considers the total cost of applying the control technology in relation to the effluent reduction benefits. The Agency also considers the age of the equipment and facilities, the processes employed, and any required process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate. Traditionally, EPA establishes BPT

[2] *Natural Res. Def. Council, Inc. v. EPA, 673 F.2d 400, 403 (D.C. Cir. 1982)* (noting that "*section 502(11)* defines 'effluent limitation' as ' *any* restriction' on the amounts of pollutants discharged, not just a numerical restriction"; holding that section of CWA authorizing courts of appeals to review promulgation of "any effluent limitation or other limitation" did not confine the court's review to the EPA's establishment of numerical limitations on pollutant discharges, but instead authorized review of other limitations under the definition) (emphasis added). In *Natural Res. Def. Council, Inc. v. Costle, 568 F.2d 1369 (D.C. Cir. 1977)*, the D.C. Circuit stressed that when numerical effluent limitations are infeasible, EPA may issue permits with conditions designed to reduce the level of effluent discharges to acceptable levels.

effluent limitations based on the average of the best performance of facilities within the industry of various ages, sizes, processes, or other common characteristics. Where existing performance is uniformly inadequate, BPT may reflect higher levels of control than currently in place in an industrial category if the Agency determines that the technology can be practically applied.

Best Conventional Pollutant Control Technology (BCT)

The 1977 amendments to the CWA required EPA to identify effluent reduction levels for conventional pollutants associated with BCT for discharges from existing industrial point sources. CWA section 301(b)(2)(E); 304(b)(4)(B); 40 CFR 125.3(d)(2). In addition to considering the other factors specified in section 304(b)(4)(B) to establish BCT limitations, EPA also considers a two part "cost-reasonableness" test. EPA explained its methodology for the development of BCT limitations in 1986. 51 FR 24974 (July 9, 1986).

Best Available Technology Economically Achievable (BAT)

For toxic pollutants and non-conventional pollutants, EPA includes technology-based effluent limitations based on BAT in NPDES permits. CWA section 301(b)(2)(A); 304(b)(2)(B); 40 CFR 125.3(d)(3). In establishing BAT, the technology must be technologically "available" and "economically achievable." The factors considered in assessing BAT include the cost of achieving BAT effluent reductions, the age of equipment and facilities involved, the process employed, potential process changes, non-water quality environmental impacts, including energy requirements and other such factors as the EPA Administrator deems appropriate. The Agency retains considerable discretion in assigning the weight accorded to these factors. BAT limitations may be based on effluent reductions attainable through changes in an Operator's processes and operations. Where existing performance is uniformly inadequate, BAT may reflect a higher level of performance than is currently being achieved within a particular subcategory based on technology transferred from a different subcategory or category. BAT may be based upon process changes or internal controls, even when these technologies are not common industry practice.

This permit contains effluent limits that correspond to required levels of technology-based control (BPT, BCT, BAT) for discharges under the CWA. Some effluent limits have been established by examining other existing laws, requirements and practices. Because these are demonstrated practices, EPA has found that they are technologically available and economically practicable (BPT) or achievable (BAT).

Technology-Based Effluent Limitations

Technology-based effluent limitations are in many cases established by EPA in regulations known as effluent limitations guidelines, or "ELGs." EPA establishes these regulations for specific industry categories or subcategories after conducting an in-depth analysis of that industry. The Act sets forth different standards for the ELGs based upon the type of pollutant or the type of permittee involved. Where EPA has not issued effluent guidelines for an industry, EPA and State permitting authorities establish effluent limitations for NPDES permits on a case-by-case basis based on their best professional judgment. See 33 U.S.C. § 1342(a)(1); 40 C.F.R. § 125.3(c)(2).

As stated above, the CWA establishes two levels of technology-based controls. The first level of control, "best practicable control technology currently available," or "BPT" applies to all

pollutants. CWA section 304(b)(1)(B); 33 U.S.C. 1314(b)(1)(B). BPT represents the initial stage of pollutant discharge reduction, designed to bring all sources in an industrial category up to the level of the average of the best source in that category. See *EPA v. National Crushed Stone Association*, 449 U.S. 64, 75-76 (1980). In the second level of control, all point sources are required to meet effluent limitations based on "best conventional pollutant control technology," or "BCT" CWA section 304(b)(4)(B); 33 U.S.C. 1314(b)(4)(B) or "best available technology economically achievable," or "BAT" CWA section 301(b)(2)(A); 33 U.S.C. 1311(b)(2)(A), depending on the types of pollutants discharged. BCT applies to conventional pollutants, listed at 40 CFR 401.16 (biological oxygen demand (BOD), pH, fecal coliform, TSS, and oil and grease). BAT applies to toxic and non-conventional pollutants. Technology-based limitations are to be applied throughout industry without regard to receiving water quality. *Appalachian Power Co. v. EPA*, 671 F.2d 801 (4th Cir. 1982

EPA's Authority to Include Non-Numeric Technology-Based Limitations in this Permit

All NPDES permits are required to contain technology-based effluent limitations. 40 CFR §§ 122.44(a)(1) and 125.3. CWA sections 301(b)(1)(A) for (BPT); 301(b)(2)(A) for (BAT); and 301(b)(2)(E) for (BCT). Technology-based effluent limitations in this permit represent the BPT (for conventional, toxic, and non-conventional pollutants), BCT (for conventional pollutants), and BAT (for toxic pollutants and non-conventional) levels of control for the applicable pollutants. When EPA has not promulgated effluent limitation guidelines for an industry, or if an Operator is discharging a pollutant not considered in the development of the effluent guideline, permit limitations may be based on the best professional judgment (BPJ, sometimes also referred to as "best engineering judgment") of the permit writer. 33 U.S.C. § 1342(a)(1); 40 CFR 125.3(c). See Student Public Interest Group v. Fritzsche, Dodge & Olcott, 759 F.2d 1131, 1134 (3rd Cir. 1985); American Petroleum Inst. v. EPA, 787 F.2d 965, 971 (5th Cir. 1986). For this permit, the technology-based effluent limitations are based on BPJ decision-making because no ELG applies.

Under EPA's regulations, non-numeric effluent limitations are authorized in lieu of numeric limitations, where "[n]umeric effluent limitations are infeasible." 40 CFR 122.44(k)(3). As far back as 1977, courts have recognized that there are circumstances when numeric effluent limitations are infeasible and have held that EPA may issue permits with conditions (e.g., best management practices) designed to reduce the level of effluent discharges to acceptable levels. Natural Res. Def. Council, Inc. v. Costle, 568 F.2d 1369 (D.C.Cir.1977).

Through the Agency's NPDES permit regulations, EPA interpreted the CWA to allow best management practices (BMPs) to take the place of numeric effluent limitations under certain circumstances. Federal Regulations at 40 CFR §122.44(k), entitled "Establishing limitations, standards, and other permit conditions (applicable to State NPDES programs ...)," provides that permits may include BMPs to control or abate the discharge of pollutants when: (1) "[a]uthorized under section 402(p) of the CWA for the control of stormwater discharges"; or (2) "[n]umeric effluent limitations are infeasible." 40 CFR § 122.44(k).

Courts have held that the CWA does not require the EPA to set numeric limitations where such limits are infeasible. Citizens Coal Council v. United States Environmental Protection Agency, 447 F3d 879, 895-96 (6th Cir. 2006). The Sixth Circuit cited to Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486, 502 (2nd Cir. 2005), stating "site-specific BMPs are effluent limitations under the CWA." Additionally, the Sixth Circuit cited to Natural Res. Def. Council,

Inc. v. EPA, 673 F.2d 400, 403 (D.C.Cir.1982) noting that "section 502(11) [of the CWA] defines 'effluent limitation' as '*any* restriction' on the amounts of pollutants discharged, not just a numerical restriction."

For this permit, EPA is using the term "Pest Management Measures," as defined in Appendix A of the permit, to represent those practices used to meet the non-numeric effluent limitations.

EPA's Decision to Include Non-Numeric Technology-Based Effluent Limitations in This Permit and Rationale for Why the Limits Represent the Appropriate (BPT, BCT, or BAT) Level of Control.

As described above, numeric effluent limitations are not always feasible because the discharges pose challenges not presented by other types of NPDES-regulated discharges. The technology-based effluent limitations in this permit are non-numeric based on the following facts:

- The point in time for which a numeric effluent limitation would apply is not easily determinable. For discharges from the application of pesticides, the discharges can be highly intermittent with those discharges not practically separable from the pesticide application itself. For example, the discharge from the application of a chemical pesticide to Waters of the United States is a discharge of pollutants when there is a residual remaining in the ambient water after the pesticide is no longer serving its intended purpose (i.e., acting as a pesticide against targeted pests in the applied medium). This discharge also will have combined with any other discharges to that waterbody (be it from other point sources, non-point source runoff, air deposition, etc). Given this situation, it is not clear what would be measured for a numeric limit or when.

- For discharges from the application of pesticides, there are often many short duration, highly variable, pesticide discharges to surface waters from many different locations for which it would be difficult to establish a numeric limitation at each location. This variability makes setting numeric effluent limitations for pesticide applications extremely difficult. In this situation, requiring the use of standard control practices (i.e., narrative non-numeric effluent limitations), provides a reasonable approach to control pesticides discharges.

- The precise location for which a numeric effluent limitation would apply is not clear. Discharges from the application of pesticide are different from discharges of process wastewater from a particular industrial or commercial facility where the effluent is more predictable and easily identified as an effluent from a conveyance (e.g., pipe or ditch), can be precisely measured for compliance prior to discharge, and can be more effectively analyzed to develop numeric effluent limitations.

- Information needed to develop numeric effluent limitations is not available at this time. To develop numeric technology-based effluent limitations, EPA must fully evaluate factors outlined in 40 CFR 125.3, such as the age of equipment and facilities involved, the process employed, the potential process changes, and non-water quality environmental impacts. In addition, EPA estimates that more than 400 pesticide active ingredients contained in over 3,500 pesticide products may be covered under this permit.

In the context of this general permit, EPA has determined these non-numeric effluent limits represent the best practicable technology (BPT) for all pollutants, the best conventional pollutant control technology for conventional pollutants (BCT) and the best available technology economically achievable (BAT) for toxic and non-conventional pollutants. EPA has determined that the combination of pollution reduction practices described below are the most environmentally sound way to control the point source discharges of biological pesticides, and chemical pesticides that leave a residue.

Technology-based effluent limitations in this permit are presented specific to each pesticide use pattern to reflect the variations in procedures and expectations for the use and application of pesticides. These non-numeric effluent limitations are expected to minimize environmental impacts by reducing the point source discharges of pesticides to Waters of the United States, thereby protecting the receiving waters, including to the extent necessary to meet applicable water quality standards. EPA notes that this permit uses the term "Pest Management Measures." Use of the term Pest Management Measures is intended to better describe the range of pollutant reduction practices that may be employed when applying pesticides, whether they are structural, non-structural or procedural and includes BMPs as one of the components.

The BAT/BPT/BCT effluent limitations in this permit are expressed as specific pollution prevention requirements for minimizing the pollutant levels in the discharge. In the context of this general permit, these requirements represent the best technologically available and economically practicable and achievable controls. EPA has determined that the combination of pollution prevention approaches and structural management practices required by these limits are the most environmentally sound way to control the discharge of pesticide pollutants to meet the effluent limitations. Pollution prevention continues to be the cornerstone of the NPDES program.

Requirements are technologically available

EPA has found that the requirements of this permit represent the appropriate level of control representing BPT, BCT, and BAT. For example, many states already require operators to evaluate pest management options or produce an IPM plan before applying pesticides. This permit is not requiring IPM, but is requiring certain Operators to implement pest management measures to meet the technology-based effluent limitations that are based on IPM principles. See further discussion of pest management measures below. Unlike other general permits, the technology available to Operators depends on the type of Operator (e.g. Applicator v. Decision-maker). For this reason, technology-based effluent limitations vary depending on Operator type. As an example of an effluent limit that meets BPT and BAT standards, applicators are required to maintain pesticide application equipment in proper operating condition, including requirement to calibrate, clean, and repair such equipment and prevent leaks, spills, or other unintended discharges. This effluent limitation is not appropriate for decision-makers that do not apply the pesticide themselves and as such, is not an effluent limitation for decision-makers. EPA determined that calibrating, cleaning, and repairing pesticide application equipment is technologically available and based on EPA's evaluation of this industry, is currently being implemented by many operators and is a practice that every operator should be doing when using pesticides as a way to prevent leaks, spills, and other unintended discharges, such as over-applying pesticides as a result of poorly maintained equipment.

Requirements meet the BPT and BAT economic tests set forth in the CWA

There are different economic considerations under BPT, BCT and BAT. EPA finds that the limits in this permit meet the BPT and BAT economic tests. Because the types of controls under consideration minimize toxic, nonconventional, and conventional pollutants, conventional pollutants are controlled by the same practices that control toxic and nonconventional pollutants. Hence, EPA is evaluating effluent limits using a BPT and a BAT standard, but since conventional pollutants will also be adequately controlled by these same effluent limits for which EPA applied the BPT and BAT tests, EPA has determined that it is not necessary to conduct BCT economic tests.

Under BPT, EPA has determined that the requirements of this permit are economically practicable. To make this determination, EPA has considered the reasonableness of the relationship between the costs of application of technology in relation to the effluent reduction benefit derived. CWA section 301(b)(1)(B); 40 CFR 125.3(d)(1). EPA estimates the total universe that will be affected by this permit includes approximately 35,000 entities. The economic analysis completed for this permit indicates that the technology-based effluent limitations will incur a total cost to the permitted universe of between $8 million and $9 million annually. Including paperwork requirements, EPA estimates the cost of the permit to the permitted universe to be between $10 million and $11 million annually. Unit costs for implementing the different technology based requirements are summarized in Table 5-13 in the PGP Economic Analysis, a copy of which is available in the PGP administrative record.

EPA has determined that the requirements of this permit are economically achievable. In determining "economic achievability" under BAT, EPA has considered whether the costs of the controls can reasonably be borne by the industry. EPA typically evaluates "closures," whereby the costs of requirements are evaluated to see whether they would cause a facility or Operator in this case to go out of business. To evaluate potential economic impacts of this permit, EPA estimated the applicable thresholds below which average per entity compliance cost could exceed a percentage of annual revenues/sales. EPA used percentages of 1% and 3% of revenues/sales to characterize the potential for significant impact. Based on this analysis, EPA concludes that the technology-based effluent limitations in this permit are unlikely to result in a substantial economic impact to the permitted universe, including small businesses. The economic analysis is available in the docket for this permit. In addition, EPA considered the non-water quality environmental impacts, including energy impacts, of the controls required under this permit and found that they are acceptable. EPA expects that the permit will result in few non-water impacts because in many cases, the permit is reflective of practices currently implemented by Operators. Hence, EPA interprets this analysis to indicate that the BAT limits are economically achievable.

EPA continues to study the efficacy of various types of pollution prevention measures and BMPs; however, for this permit numeric limitations are not feasible.

Pest Management Measures Used to Meet the Technology-Based Effluent Limitations

Just as there is variability in the pesticide applications as described above, there is variability in the Pest Management Measures that can be used to meet the effluent limitations. Therefore, EPA is not mandating the specific Pest Management Measures Operators must implement to meet the limitations. This is analogous to an industrial situation where discharges

to Waters of the United States are via pipes and a numeric effluent limitation may be specified as a given quantity of pollutant that may be discharged, but EPA would not specify what technology should be employed to meet that limitation. For pesticides, namely mosquitocides, for example, Part 2.2.1.b of the PGP requires mosquito control Decision-makers to consider mechanical/physical methods of control to eliminate or reduce mosquito habitat. How this is achieved will vary by Operator: For some, this may be achieved through elimination of development habitat (e.g. filling low areas, dredging, etc.) while for others these measures will not be feasible. Thus, a given Pest Management Measure may be acceptable and appropriate in some circumstances but not in others. In this respect, the non-numeric effluent limitations in this permit are similar to numeric effluent limitations, which also do not require specific control technologies as long as the limitations are met.

Pest Management Measures can be actions (including processes, procedures, schedules of activities, prohibitions on practices and other management practices), or structural or installed devices to prevent or reduce water pollution. The key is determining what measure is appropriate for your situation in order to meet the effluent limitation. In this permit, Operators are required to implement site-specific Pest Management Measures to meet these effluent limitations. The permit along with this fact sheet provides examples of Pest Management Measures, but Operators must tailor these to their situations as well as improve upon them as necessary to meet the effluent limitations.

The approach to Pest Management Measures in this permit is consistent with the CWA as well as its implementing regulations at 40 CFR 122.44(k)(4). Section 402(a)(2) of the CWA states: “The administrator shall prescribe conditions for such permits to assure compliance with the requirements in paragraph (1) . . . including conditions on data and information collection, reporting and such other requirements as he deems appropriate." (Section 402(a)(1) includes effluent limitation requirements.) This statutory provision is reflected in the CWA implementing regulations, which state that Pest Management Measures can be included in permits when, “[t]he practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.” 40 CFR 122.44(k)(4).

Implementation of Pest Management Measures

Part 2.0 of this permit requires Operators to implement Pest Management Measures to meet the technology-based effluent limitations listed in that Part. It also provides Operators with important considerations for the implementation of their specific Pest Management Measures. Some Decision-makers will have to document how such factors were taken into account in the implementation of their Pest Management Measures (See Part 5). EPA recognizes that not all of these considerations will be applicable to every pest management area nor will they always affect the choice of Pest Management Measures. EPA expects Operators to have the experience and working knowledge to apply pesticides properly. The PGP requires the Operator to apply such expertise and working knowledge to use best professional judgment in meeting the permit terms. If Operators find their Pest Management Measures are not minimizing discharges of pesticide adequately, the Pest Management Measures must be modified as expeditiously as practicable. See Part 6, Corrective Action.

EPA believes flexibility is needed for Operators to tailor Pest Management Measures to their situation as well as improve upon them as necessary to meet the technology-based effluent

limitations; with the selection of Pest Management Measures based on available information and best professional judgment of personnel who are qualified to make pest management decision. For example, while Part 2.2 requires Decision-makers to evaluate other means than pesticide use, it remains the best professional judgment what ultimate pest control method is employed. Thus, while mechanical pest removal or less toxic chemicals may be possible options, the Decision-maker is in the best position to know what method is most appropriate and effective against the target pest.

Pest Management Measures and Technology-Based Effluent Limitations – Definition of "Minimize"

EPA has found that the requirements of this permit represent the appropriate level of control to address BPT, BCT, and BAT. The non-numeric effluent limitations require Operators to "minimize" discharges of pesticide. Consistent with the control level requirements of the CWA, the term "minimize" means to reduce and/or eliminate pesticide discharges to Waters of the United States through the use of Pest Management Measures to the extent technologically available and economically achievable and practicable. EPA believes that for many pesticide applications minimization of the discharge of pesticides to Waters of the United States can be achieved without using highly engineered, complex pest control systems. The specific limits included in Part 2.0 emphasize effective "low-tech" approaches, including using only the amount of pesticide product and frequency of pesticide application necessary to control the target pest, performing equipment maintenance and calibration, assessing weather conditions prior to pesticide application, accurately identifying the pest problem, efficiently and effectively managing the pest problem, and properly using pesticides.

Statutes, Regulations, and Other Requirements

Operators must comply with all applicable statutes, regulations and other requirements including, but not limited to requirements contained in the labeling of pesticide products approved under FIFRA ("FIFRA labeling"). Although the FIFRA label and labeling requirements are not effluent limitations, it is illegal to use a registered pesticide inconsistent with its labeling. If Operators are found to have applied a pesticide in a manner inconsistent with any relevant water-quality related FIFRA labeling requirements, EPA will presume that the effluent limitation to minimize pesticides entering the Waters of the United States has been violated under the NPDES permit. EPA considers many provisions of FIFRA labeling -- such as those relating to application sites, rates, frequency, and methods, as well as provisions concerning proper storage and disposal of pesticide wastes and containers -- to be requirements that affect water quality. For example, an Operator, who is a pesticide Applicator, decides to use a mosquito adulticide pesticide product with a FIFRA label that contains the following language, "Apply this product at a rate not to exceed one pound per acre." The Applicator applies this product at higher than the allowable rate, which results in excess product being discharged into Waters of the United States. EPA would find that this application was a misuse of the pesticide under the FIFRA label and because of the misuse; the Agency might also determine that the effluent limitation that requires the Operator to minimize discharges of pesticide products to Waters of the United States was also violated, depending on the specific facts and circumstances. Therefore, pesticide use inconsistent with certain FIFRA labeling requirements could result in the Operator being held liable for a CWA violation as well as a FIFRA violation.

Technology-Based Effluent Limitations in the PGP

In this permit, all Operators are classified as either "Applicators" or "Decision-makers" or both. An Applicator is an entity who performs the application of a pesticide or who has day-to-day control of the application (i.e., they are authorized to direct workers to carry out those activities) that results in a discharge to Waters of the United States. A Decision-maker is an entity with control over the decision to perform pesticide applications, including the ability to modify those decisions that result in discharges to Waters of the United States. As such, more than one Operator may be responsible for compliance with this permit for any single discharge from the application of pesticides. EPA has delineated the non-numeric effluent limitations into tasks that EPA expects the Applicator to perform and tasks that EPA expects the Decision-maker to perform. In doing so, EPA has assigned the Applicator and the Decision-maker different responsibilities.

2.1 Applicators' Responsibilities

Part 2.1 of this permit contains the general technology-based effluent limitations that *all* Applicators must perform, regardless of pesticide use pattern. These effluent limitations are generally preventative in nature, and are designed to minimize pesticide discharges into Waters of the United States. All Applicators are required to minimize the discharge of pesticides to Waters of the United States by doing the following:

2.1.1 To the extent not determined by the Decision-maker, use only the amount of pesticide and frequency of pesticide application necessary to control the target pest, using equipment and application procedures appropriate for this task.

As noted earlier, it is illegal to use a pesticide in any way prohibited by the FIFRA labeling. Also, use of pesticides must be consistent with any other applicable state or federal laws. To minimize the total amount of pesticide discharged, Operators must use only the amount of pesticide and frequency of pesticide application necessary to control the target pest. Using only the amount of pesticide and frequency of pesticide application needed ensures maximum efficiency in pest control with the minimum quantity of pesticide. Using only the amount and frequency of applications necessary can result in cost and time savings to the user. To minimize discharges of pesticide, Operators should base the rate and frequency of application on what is known to be effective against the target pest.

2.1.2 Maintain pesticide application equipment in proper operating condition, including requirement to calibrate, clean, and repair such equipment and prevent leaks, spills, or other unintended discharges.

Common-sense and good housekeeping practices enable pesticide users to save time and money and reduce the potential for unintended discharge of pesticides to Waters of the United States. Regular maintenance activities should be practiced and improper pesticide mixing and equipment loading should be avoided. When preparing the pesticides for application be certain that you are mixing them correctly and preparing only the amount of material that you need. Carefully choose the pesticide mixing and loading area and avoid places where a spill will discharge into Waters of the United States. Some basic practices Operators should consider are:

- Inspect pesticide containers at purchase to ensure proper containment;
- Maintain clean storage facilities for pesticides;
- Regularly monitor containers for leaks;
- Rotate pesticide supplies to prevent leaks that may result from long term storage; and
- Promptly deal with spills following manufacturer recommendations.

To minimize discharges of pesticides, Applicators must ensure that the rate of application is calibrated (i.e. nozzle choice, droplet size, etc.) to deliver the appropriate quantity of pesticide needed to achieve greatest efficacy against the target pest. Improperly calibrated pesticide equipment may cause either too little or too much pesticide to be applied. This lack of precision can result in excess pesticide being available or result in ineffective pest control. When done properly, equipment calibration can assure uniform application to the desired target and result in higher efficiency in terms of pest control and cost. It is important for Applicators to know that pesticide application efficiency and precision can be adversely affected by a variety of mechanical problems that can be addressed through regular calibration. Sound maintenance practices to consider are:

- Choosing the right spray equipment for the application
- Ensuring proper regulation of pressure and choice of nozzle to ensure desired application rate
- Calibrating spray equipment prior to use to ensure the rate applied is that required for effective control of the target pest
- Cleaning all equipment after each use and/or prior to using another pesticide unless a tank mix is the desired objective and cross contamination is not an issue
- Checking all equipment regularly (e.g., sprayers, hoses, nozzles, etc.) for signs of uneven wear (e.g., metal fatigue/shavings, cracked hoses, etc.) to prevent equipment failure that may result in inadvertent discharge into the environment
- Replacing all worn components of pesticide application equipment prior to application.

2.1.3. Assess weather conditions (e.g. temperature, precipitation, and wind speed) in the treatment area to ensure application is consistent with all applicable federal requirements.

Weather conditions may affect the results of pesticide application. Applicators must assess the treatment area to determine whether weather conditions support pest populations and are suitable for pesticide application.

2.2. Decision-makers' Responsibilities

As noted above, NPDES permits must contain technology-based effluent limitations. Part 2.2 of this permit contains the effluent limitations that Decision-makers must perform. The PGP requires *all* Decision-makers, to the extent Decision-makers determine the amount of pesticide or frequency of pesticide application, to minimize the discharge of pesticides to Waters of the United States from the application of pesticides, through the use of Pest Management

Measures, as defined in Appendix A of this permit, by using only the amount of pesticide and frequency of pesticide application necessary to control the target pest.

In addition, Part 2.2 of this permit requires that any Decision-maker who is or will be[3] required to submit a Notice of Intent (NOI) to identify the pest problem, implement effective and efficient pest management options, and adhere to certain pesticide use provisions. (For purposes of the discussion below on Part 2.2, the term Decision-maker means any Decision-maker who is or will be required to submit an NOI.) Parts 2.2.1 – 2.2.4 do not apply to Decision-makers that will need to submit an NOI only because they discharge to Waters of the United States containing NMFS Listed Resources of Concern and whose: (1) Pesticide application activities for which permit coverage is being requested will discharge to one or more receiving Waters of the United States containing NMFS Listed Resources of Concern, but consultation with NMFS under Section 7 of the ESA has been concluded for pesticide application activities covered under this permit; or (2) Pesticide application activities for which permit coverage is being requested will discharge to one or more Waters of the United States containing NMFS Listed Resources of Concern, but all "take" of these resources associated with such pesticide application activities has been authorized through NMFS' issuance of a permit under Section 10 of the ESA, and such authorization addresses the effects of the pesticide discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. However, these Decision-makers must comply with all applicable conditions and/or requirements resulting from Section 7 consultation or Section 10 permit.

Decision-makers are required to perform each of these permit conditions prior to the first pesticide application covered under this permit and at least once each calendar year thereafter. These additional technology-based effluent limitations are based on integrated pest management principles. EPA is requiring certain Decision-makers to also comply with different technology-based effluent limitation than Applicators because we have found that they are the Best Available Technology Economically Achievable for these Operators. These requirements are aimed at reducing discharge of pesticides to Waters of the United States and lessening the adverse effects of pesticides that are applied. Each pesticide use pattern has specific limitations, and these requirements are divided into three different sections: (1) identify the problem, (2) pest management options, and (3) pesticide use. For each pest management area, Decision-makers must identify the problem prior to pesticide application, consider using a combination of chemicals and non-chemical Pest Management Measures, and perform surveillance before pesticide application to reduce environmental impacts.

EPA expects that many of these Decision-makers are already implementing Pest Management Measures that are likely to meet these technology-based effluent limitations. EPA is requiring these additional technology-based effluent limitation requirements from Decision-makers and not the Applicators because the measures necessary to meet these requirements are within the control of the Decision-makers, not the Applicators. Based on comments received on the proposed permit, the Applicators' main role is to apply pesticide when needed.

[3] Decision-makers who are required to submit an NOI, but are discharging between October 31, 2011 and January 12, 2012, must begin complying with Part 2.2 requirements as of October 31, 2011.

As stated above, these technology-based effluent limitations are based on integrated pest management principles. Integrated pest management, as defined in FIFRA, is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks. (FIFRA, 7 U.S.C. 136r-1) Integrated pest management is not a single pest control method but, rather, a series of pest management evaluations, decisions and controls. In evaluating available and relevant information, EPA found that some commercial (For-Hire Applicators) and non-commercial (e.g., state governments, federal governments, local governments, utilities) entities are currently implementing integrated pest management or components of integrated pest management to minimize pesticide use. For example, federal agencies are required to implement integrated pest management under 7 USC 136r-1, "Federal agencies shall use Integrated Pest Management techniques in carrying out pest management through procurement and regulatory policies, and other activities." In addition, Executive Order 13514 (October 5, 2009) requires the head of each federal agency to implement integrated pest management and other appropriate landscape management practices as a means to promote pollution prevention and eliminate waste. EPA has found that mosquito control operations are performed by local government entities and that they are generally performing integrated pest management.

Below is a general discussion describing the limitations for all pesticide use patterns. Following the general discussion are more detailed descriptions of each specific requirement under each pesticide use pattern.

Any Decision-maker who is or will be required to submit an NOI must do the following regardless of the pesticide use pattern:

Identify the Problem

Decision-makers are required to identify the pest problem, identify the target pest, and establish an action threshold. Understanding the pest biology and ecology will provide insight into selecting the most effective and efficient Pest Management Measures (pesticidal or non-pesticidal methods), and in developing an action threshold. Action threshold is defined in Appendix A of this permit as the point at which pest populations or environmental conditions cannot be tolerated necessitating that pest control action be taken based on economic, human health, aesthetic, or other effects. An action threshold helps determine both the need for control actions and the proper timing of such actions. It is a predetermined pest level that is deemed to be unacceptable. In some situations, the action threshold for a pest may be zero (i.e., no presence of the pest is tolerated). This is especially true when the pest is capable of transmitting a human pathogen (e.g., mosquitoes and the West Nile virus) and/or is an invasive species. In areas where aquatic weeds are problematic, it may be preferable to use an aquatic herbicide as a preventive measure rather than after weeds become established. In some situations, even a slight amount of pest damage may be unacceptable for ecological or aesthetic reasons. Sometimes pre-emergent pesticide application is needed, as a preventive measure to keep aquatic weeds at bay. Action thresholds, often expressed as number of pests per unit area, can vary by pest, by site, and by season. In a new pest management program, action thresholds may be difficult to establish and as a practical approach should first focus on major pests. As Operators gain insight and experience into specific pest management settings, the action levels can be revised up or down.

To identify the problem at a treatment area, Decision-makers may use existing data to meet the conditions of this permit. For example, a mosquito district may use surveillance data from an adjacent district to identify pests in their pest management area. Decision-makers may also use relevant historical site data.

Pest Management Options

Decision-makers are required to implement efficient and effective means of Pest Management Measures that most successfully minimize discharges to Waters of the United States resulting from the application of pesticides. Decision-makers must evaluate both pesticide and non-pesticide methods. Decision-makers must consider and evaluate the following options: no action, prevention, mechanical/physical methods, cultural methods, biological control agents, and pesticides. In the evaluation of these options, Decision-makers must consider impacts to water quality, impacts to non-target organisms, feasibility, and cost effectiveness. Combinations of various management options are frequently the most effective Pest Management Measures over the long term. The goal should be to emphasize long-term control rather than a temporary fix. For additional information, see discussion under each pesticide use pattern.

Pesticide Use

Decision-makers are required to conduct pest surveillance in an area that is representative of the pest problem and reduce the impact on the environment. Pest surveillance is important to properly time the need for pest control. To reduce the impact on the environment and non-target organisms, Operators are required to only apply pesticide when the action threshold has been met. As noted earlier, action thresholds help determine both the need for control actions and the proper timing of such actions.

There are additional requirements designed for each pesticide use pattern in Sections 2.2.1 through 2.2.4 of this permit. For additional information and other limits on pesticide use, see specific discussion under each pesticide use pattern.

2.2.1 Mosquito and Other Flying Insect Pests Control

i. Mosquitoes

Background

There are over 2500 different species of mosquitoes throughout the world with approximately 200 species occurring in the United States. The total budgets for mosquito control in the United States exceed $200,000,000 annually (AMCA 2009). Mosquitoes can be a source of annoyance (e.g., work and leisure activities), a limiting factor in economic development (e.g., residential development and property value), a causal factor in decreased agricultural productivity (e.g., animal weight loss/death and decreased milk production) from irritation and blood loss, and a source of disease transmission (e.g., malaria, encephalitis, yellow fever, dengue, and West Nile Virus). Most of these diseases have been prominent as endemic or epidemic diseases in the United States in the past, although today, only the insect-borne (arboviral) encephalitides and West Nile virus fever occur annually and dengue occurs periodically in this country. Thus, control of mosquitoes is an important public health issue.

Numerous strategies are used to reduce the impact of mosquitoes but a comprehensive approach using a variety of complementary control methods is usually necessary for any mosquito control program.

Of major concern is the transmission of microorganisms that cause diseases such as western equine encephalitis and St. Louis encephalitis. Both of these diseases can cause serious, sometimes fatal neurological ailments in people. (Western equine encephalitis virus also causes disease in horses.) Western equine encephalitis infections tend to be more serious in infants while St. Louis encephalitis can be a problem for older people. These viruses normally infect birds or small mammals. During such infections, the level of the virus may increase in these infected animals facilitating transmission to humans by mosquitoes. The West Nile virus, which can also cause encephalitis, was found in the northeastern United States for the first time in 1999, and is a good example of this mode of transmission. Over 20,000 human cases of West Nile virus have been reported in the United States. Symptoms of human illness can range from mild flu-like symptoms to severe encephalitis, meningitis, or acute flaccid paralysis. Over 800 people have died from West Nile virus since its emergence in North America in 1999 (CDC).

Other pathogens transmitted by mosquitoes include a protozoan parasite which causes malaria, and *Dirofilaria immitis*, a parasitic roundworm and the causative agent of dog heartworm. Disease carrying mosquito species are found throughout the United States, especially in urban areas and coastal or inland areas where flooding of low lands frequently occurs. Even when no infectious diseases are transmitted by mosquitoes, they can be a health problem to people and livestock. Mosquito bites can result in secondary infections, allergic reactions, pain, irritation, redness, and itching.

ii. Black Flies

Background

Black flies, commonly referred to as buffalo gnats, are the smallest of the blood feeding dipterans. Worldwide, blackflies are responsible for transmitting ochocerciasis (river blindness) to millions of people in tropical areas. Black flies can also vector bovine onchocerciasis, mansonellosis, and leucoytozoonosis in wild and domestic animals. While generally only considered nuisance pests in the United States, epidemiological research has demonstrated that black flies are competent vectors of vesicular stomatitis and suggests that these pests may be responsible for periodic outbreaks of this disease in livestock, wildlife, and humans in the western United States. However, flies may also become so abundant as to be drawn into the air passages of livestock, occasionally resulting in death. Black fly feeding activity may also result in allergic reaction in both animals and man as a result of histaminic substances in black fly saliva.

There are 1800 species of black flies throughout the world with approximately 254 species in North America alone. Black flies can be 1) a source of annoyance to people, animals, and wildlife, 2) a limiting factor in economic development (e.g., residential development and property value), and 3) a causal factor in decreased agricultural productivity (e.g., animal weight loss/death and milk production). Black fly control in the United States provides economic, health and quality of life benefits. In contrast to the integrated approach used for mosquito

control, due to its unique biology, black fly control in the United States is primarily through the use of larvicides.

Part 2.2.1.a -- Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to Waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, any Decision-makers who is or will be required to submit an NOI must do the following for each pest management area, as defined in Appendix A. Decision-makers must identify the pest problem in their pest management area prior to the first application covered under this permit. Knowledge of the pest problem is an important step to developing Pest Management Measures. Re-evaluation of the pest problem is also important to ensure Pest Management Measures are still applicable. Decision-makers must identify the pest problem at least once each calendar year prior to the first application for that calendar year.

Establish densities for larval and adult mosquito or flying insect pest populations or identify environmental condition(s), either current or based on historical data, to serve as action threshold(s) for implementing Pest Management Measures. Decision-makers must develop action thresholds for larval and adult mosquito prior to the first pesticide application covered under this permit. The action thresholds must be re-evaluated at least once each calendar year. As noted in the general discussion above, an action threshold is a point at which pest populations or environmental conditions indicate that pest control action must be taken. Action thresholds help determine both the need for control actions and the proper timing of such actions. For example, an action threshold could be the number and distribution of service requests received from the public. It is a predetermined pest level (or other indicator) that is deemed to be unacceptable. For example in Maryland, "A collection of more than 10 anthropophagous (human biting) female mosquitoes per night of trap operation is considered to be the level which causes discomfort and/or complaints from the majority of people. The light trap action threshold for ground spraying of adult mosquitoes is 10-20 per trap-night. The action threshold to suppress pest populations of adult mosquitoes by aerial spraying (application of insecticide by an aircraft) is a light trap collection of 100 female mosquitoes. The action threshold for landing rate counts to justify ground spraying for the control of adult mosquitoes is 1 to 3 in 1 minute. The action threshold for aerial spraying is 12 mosquitoes per minute."[4] For larvae control, action thresholds are determined by standard mosquito dipping techniques. For example, in Canyon County Mosquito Abatement District, Idaho[5], they established larvae density action levels for Culex species (primary disease vectors) as Low: 1-5 larvae per dip; Medium: 6-10 larvae per dip; High: > than 10 larvae per dip. The larvae density action threshold can be used to determine how much larval control products are to be used or even if any action is to be taken. In some situations, the action threshold for a pest may be zero (i.e., no presence of

[4] http://www.mda.state.md.us/plants-pests/mosquito_control/mosquito_control_program_description.php
[5] http://www.canyoncountymosquito.com/CCMADMosquitoPesticideUsePlan.pdf

the pest is tolerated). This is especially true when the pest is capable of transmitting a human pathogen (e.g., mosquitoes and the West Nile virus).

Identify the target pest(s) to develop Pest Management Measures based on developmental and behavioral considerations for each pest. Knowledge of the developmental biology of mosquitoes is essential to developing Pest Management Measures for mosquito control. The mosquito undergoes complete metamorphosis and has four distinct stages in its life cycle: egg, larva, pupa, and adult. Depending on the species, eggs are deposited either in permanent water habitats or in temporary/floodwater habitats. Egg deposition in permanent water habitats occurs as individual eggs or as multiple egg rafts deposited directly to the water surface in natural or artificial water-holding containers found in the domestic environment or in naturally occurring pools. Egg rafts may contain 100-200 eggs. A batch laid of single eggs may range from 60-100 eggs. Egg deposition in temporary/floodwater habitats occurs as individual eggs on moist soil (e.g., roadside ditches, depressions, farmland irrigation ditches, etc.) or in other objects (e.g., flower pots, cans, tires, tree holes, etc.) in which periodic flooding will occur. Eggs deposited in permanent habitats will hatch in a few days whereas eggs deposited in temporary/floodwater habitats are resistant to desiccation in the absence of flooding and can withstand drying for extended periods of time (weeks to months) before hatching.

Following egg hatching, typically 2-3 days after laying, mosquitoes go through four larval developmental stages (instars) commonly known as wrigglers. Larval development may be completed in a week or less under ideal conditions but may also take longer depending on the species, geography, and environmental conditions (e.g., crowding, food availability, and water temperature). The first three larval instars continually feed on detritus, algae, bacteria, and fungi. However, some mosquito species are predacious with larva feeding on other mosquitoes and/or small aquatic invertebrates. Late in the fourth larval instar the larvae ceases to feed in preparation for pupation. The pupal stage, commonly referred to as a tumbler, is a non-feeding developmental stage in which the adult form is developed. Following a few hours to several days, dependent upon species and water temperature, the adult emerges from the pupae.

The adult mosquito is the pestiferous stage. Adults emerge from the water surface and after a short period of rest seek out a food source. Both males and females feed on nectar of flowers and other sugar sources as a source of energy. Only female mosquitoes seek out a blood meal as a source of protein and lipids for egg development. However, females of some species are autogenous (i.e., able to use energy reserves carried over from the immature stage to develop the first egg batch). In addition, most mosquitoes have preferred hosts which may include warm and cold blooded animals and birds. Human blood meals are seldom first or second choices with livestock, smaller mammals and/or birds generally preferred. Host seeking and blood feeding activities by mosquitoes are initiated by a complex variety of host and environmental cues (e.g., carbon dioxide, temperature, moisture, smell, color, movement and host preference). Adult feeding activity is generally either crepuscular (early morning, dusk and into the evening) or diurnal (daytime, particularly in relation to cloudy days and shaded areas). Although highly variable by species and environmental conditions, a complete development cycle can occur every one to three weeks. An understanding of the developmental biology of species in a given area provides the basis for developing Pest Management Measures aimed at reducing pesticide discharges into Waters of the United States.

Prior to the first pesticide application covered under this permit, Operators must ensure proper identification of mosquito to better understand the biology of the target pest and develop Pest Management Measures. Due to the great variability in developmental habitats and adult feeding behaviors as discussed previously, proper identification is imperative in designing an effective and efficient Pest Management Measures. Identification of the target pest will aid in development of Pest Management Measures aimed at both the immature and adult developmental stages. Identification of the target pest for a specific area allows 1) identification of potential breeding sites, 2) evaluation of alternative Pest Management Measures aimed at controlling the immature stages (habitat modification, source reduction, larvicides, biological larvicides, and oils), and 3) assessment of potential for disease transmission.

For black flies, the life cycle includes four stages: egg, larva, pupa, and adult. All are aquatic except the adults, which leave the water to search for food and mates. Black fly immatures have three general life history strategies. One group of species produces one generation per year (univoltine) that matures in late winter or early spring. A second group is also univoltine, but these species develop during late spring or summer. The third and final group of species produces two or more generations per year (bivoltine or multivoltine) that typically develop from early summer through fall.

Adult females deposit from 150 to 500 eggs in flowing water. Flowing water habitats capable of black fly production range from a 4-inch trickle to large rivers. Egg-laying occurs near dusk for many species. The eggs are dropped singly from the air or deposited in masses on trailing vegetation, rocks, debris and other substrates. Eggs hatch in two days to eight months, depending on black fly species and water temperature. Incubation time in some species is delayed by a prolonged diapause, or resting period. Eggs of many species can successfully withstand temperature extremes and fluctuating water levels associated with seasonal flood and drought conditions, .Many species overwinter in the egg stage, but a few black flies spend the winter months as larvae and pupae, or rarely, as adults.

Larvae anchor themselves to clean vegetation, rocks, or debris by spinning a small silken pad with their mouthparts and inserting a row of hooks at the end of their enlarged abdomen into the silk pad. This technique allows the larvae to secure themselves in areas of very fast water velocity and orient their body with the abdomen pointed upstream, and head positioned downstream to feed. Larvae can easily relocate to other areas by drifting downstream on a silken thread, spinning a new silk pad, and reattaching themselves in areas with more acceptable substrates or food supplies. Feeding is accomplished by expanding a pair of fan-like structures on their hardened head capsule to efficiently filter microscopic food particles from the water column. The larvae filter or scrape very fine organic matter, filamentous algae, bacteria and tiny aquatic animals from the current or substrates. Larvae are often infected with various parasites and pathogens, including nematode worms, bacteria, fungi, protozoa and viruses.

Larval instars vary from four to nine, depending on species, with many species passing through an average of seven instars. Larval development time varies from one week to six months depending on species, water temperature, stream turbidity and food availability. Larval growth is very temperature dependent, with relatively slow growth during the cold winter months and very rapid growth during warm summer water temperatures. Some summer-developing, multivoltine species are capable of completing their entire life cycle in just a few weeks. Mature

larvae, with fully developed respiratory filaments visible as a dark area on each side of the thorax, stop feeding, and construct a silken pupal cocoon where metamorphosis takes place.

Pupae secure themselves inside their cocoons with rows of spine-like hooks on their abdomen. The tightly woven or loose cocoons, characteristically shaped for each species, are attached to substrates with the closed end facing upstream to protect pupae from current and sediments. Some species have a lateral aperture, or window, on each side of the cocoon to increase water circulation around the pupa. The branched respiratory organs that project from the pupal thorax are designed to function in or out of water. This adaptation allows pupae to obtain oxygen at all times, and survive normal fluctuations in water levels. The pupal stage may last from two days to several weeks depending on the species and water temperature.

Adults emerge from the pupal skin through an elongate slit at the top of the thorax and ride a bubble of air that propels them to the water surface. Freshly emerged adults fly to streamside vegetation where their wings and bodies quickly dry and harden. Mature adults immediately seek food sources and mates. Both sexes feed on nectar, sap, or honeydew to obtain the sugar used for flight and energy. Only females feed on blood. In most species, mating takes place in flight, with females flying into male swarms that form over landmarks such as waterfalls, vegetation or host species. Males utilize their large eyes to detect and seize females entering the swarm. Male and female pairs exit the swarm, and mating takes place in flight in just a few seconds. Females then seek a host to obtain the blood meal required to nourish their eggs. Adults are strong fliers, capable of dispersing many miles from their larval habitats.

Black fly females are attracted to their specific hosts by size, shape, color, carbon dioxide, body odor, body movement, skin texture, temperature and humidity. Females use their mouthparts to cut, or lacerate the host skin, and then drink from the resulting pool of blood. Anticoagulants in the saliva are injected into the bite to facilitate bleeding. Many domestic and wild animals have been killed by outbreaks of adult black flies. Deaths have been attributed to acute toxemia from large numbers of bites, anaphylactic shock, and weakness due to blood loss. In humans, lesions can develop at the bite, accompanied by reddening, itching, and swelling. In severe cases, allergic reactions may occur, resulting in nausea, dizziness, and fever.

Host specificity in black flies varies from highly specific species that will feed on blood from only one host, to much more generalized species that will draw blood from a number of different hosts. Although host preferences for many North American black flies are poorly understood, it is estimated that 67% feed on mammals and 33% feed on birds. Approximately 10% of North American species will feed on the blood of humans.

Prior to first pesticide application covered under this permit, Operators must ensure proper identification of the pest to develop Pest Management Measures. Due to preferred hosts and developmental habitats, proper identification of the pest is instrumental in determining the biology (univoltine or multivoltine), and developmental habitat preference (e.g., flow rate, stream size, stream substrate composition), and flight range of the target pest. By knowing these factors, a control program can 1) determine if the black fly species warrants control activities (i.e. host preference and historical problems), 2) identify habitats and delineate the potential area for ongoing monitoring and control activities, 3) determine frequency of site monitoring, 4) estimate timing for pesticide application (i.e. historical seasonal occurrence, age distribution of

susceptible immature population, environmental conditions suitable for control activity, etc.), 5) reduce discharge of pesticides into Waters of the United States.

Identify known breeding sites for source reduction, larval control program, and habitat management. Once pests have been identified, mapping is a valuable tool in assessing mosquito habitats and designing control programs for a specific area to minimize pesticide discharges into Waters of the United States. Maps may simply be township/city/county maps but may also include aerial photo assessments, topographic maps, and satellite imagery where available and/practicable. Mapping is essential to identify pest producing areas which can and cannot be controlled using non-chemical preventative measures (e.g., source reduction). Maps should include all potential sites for mosquito development including agricultural areas in the specific area (e.g., hay, pasture, circle irrigation, orchards, rill irrigated field crops, and flood irrigated pastures and farmland). Mapping should also be a priority in a surveillance program utilizing mosquito traps, biting counts, complaints, and reports from the public. Planning in coordination with mapping ensures the best Pest Management Measures (whether source reduction, biological, or chemical) for each particular pest is chosen. Operators must identify known breeding sites prior to the first pesticide application covered under this permit.

In conjunction with identifying the target pest, mapping should be considered part of control programs aimed at black fly management. As black flies are strong fliers and will travel great distance to obtain a blood meal, mapping should be for an extended area from the site to be protected by control activities. Pest identification and mapping should also be a priority in a surveillance program (both current and historical) to determine the need for initiating control activity. Identification and mapping are both essential to planning a control program which reduces pesticide discharges into Waters of the United States.

Analyze existing surveillance data to identify new or unidentified sources of mosquito or flying insect pest problems as well as sites that have recurring pest problems. As discussed above, mapping is a valuable tool in assessing mosquito habitats and designing control programs. Decision-makers must analyze existing surveillance data to identity any new source of pest problems.

In the event there are no data for the pest management area in the past calendar year, use other available data as appropriate to meet the permit conditions in Part 2.2.1.a. Decision-makers may use historical data or neighboring district data to identify the pest and establish action thresholds.

Part 2.2.1.b -- Pest Management Options

Prior to the first pesticide application covered under this permit that will result in a discharge to Waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, any Decision-maker who is or will be required to submit NOIs must select and implement efficient and effective means of Pest Management Measures that minimize discharges resulting from the application of pesticides to control mosquitoes or other flying insect pests. In developing the Pest Management Measures for each pest management area, the Decision-maker must evaluate the following management options, including a combination of these management options,

considering impact to water quality, impact to non-target organisms, feasibility, and cost effectiveness: No action; Prevention; Mechanical/physical methods; Cultural methods; Biological control agents; and Pesticides.

Decision-makers are required to evaluate management options and implement Pest Management Measures to minimize pesticide discharges into Waters of the United States prior to the first pesticide application covered under this permit. For blackflies, Pest Management Measures will vary by locality (i.e. stream size, stream substrate, and stream vegetation), black fly species (i.e. multi/univoltine development and host specificity), and financial concerns (i.e. accessibility to streams and size/rate of flow for the streams). As noted above, combinations of various management options are frequently the most effective Pest Management Measures over the long term. The goal should be to emphasize long-term control rather than a temporary fix. Decision-makers must reevaluate every year prior to the first pesticide application for that calendar year.

Based on problem identification, two preventive measures other than pesticides should be evaluated for blackflies. The first is reducing the number of black fly breeding areas. This may include removal (physical and/or chemical) of vegetation and other objects in streams to reduce number of larval habitats. The second is temporary damming of flowing stream larval development sites to create pool habitats. As larvae require flowing water for development, pooling can kill developing black fly larvae. However, the impact of these habitat management options must be considered in relation to other environmental impacts on other aquatic species. Furthermore, due to the wide variability in stream size/flow rate and the accessibility of streams for habitat modification, these options are seldom acceptable control solutions for most black fly developmental habitats.

The following describes the management options that must be evaluated.

No Action. No action is to be taken, although a mosquito problem has been identified. This may be appropriate in cases where, for example, available control methods may cause secondary or non-target impacts that are not justified or no control methods exist.

Prevention. Prevention strategies are program activities which eliminate developing mosquito populations through environmental modification and/or habitat management. For mosquito control, these activities are physical methods such as habitat modification, cultural methods that reduce sources of mosquitoes, and biological control.

Mechanical/Physical Methods. Habitat modification, also known as physical or permanent control, is in many cases the most effective mosquito control technique available and is accomplished by eliminating mosquito breeding sites. Habitat modification activities have the potential to be both effective and economical in some areas and can virtually eliminate the need for pesticide use in and adjacent to the affected habitat. However, the ability to use prevention strategies is dependent upon local authority and restrictions.

Cultural Methods. Cultural methods can reduce sources of mosquitoes and can be as simple as properly discarding old containers that hold water capable of producing *Aedes aegypti*, *Ae. albopictus* or *Culex spp*. or as complex as implementing Rotational Impoundment Management (RIM) or Open Marsh Water Management (OMWM) techniques. RIM is a source reduction

strategy that controls salt marsh mosquitoes (e.g., *Ae. taeniorhynchus* and *Ae. sollicitans*) at the same time as significant habitat restoration is occurring. Source reduction may include; water management, vegetation management, biological control, and pesticide use in non-Waters of the United States.

Containers provide excellent habitats for development of numerous mosquito species. These may include but are not limited to flowerpots, cans, and tires. Container-inhabiting mosquitoes of particular concern include, *Ae. aeypti*, *Ae. albopictus, Cx. p. pipiens,* and *Cx. salinarious*. A container-breeding mosquito problem can be solved by properly disposing of such materials, covering them, tipping them over to ensure that they do not collect water, and/or periodic draining. Urban container-breeding mosquito control is best implemented through education and surveillance programs.

Source reduction in freshwater lakes, ponds, and retention areas is more applicable to artificially created areas than natural areas. Artificial ponds can be eliminated as a breeding site simply by filling in the areas, (i.e. habitat modification). However, large permanent water bodies and areas for stormwater or wastewater retention require other methods. Options for these areas include minimizing and/or eliminating emergent and standing vegetation, maintenance of steep banks, and inclusion of deep water areas as sanctuary for larvivorous fish.

Mosquito production from stormwater/wastewater habitats can result in considerable mosquito problems as a result of engineering, poor construction or improper maintenance. However, mosquito populations can typically be managed by keeping such areas free of weeds through an aquatic plant management program and maintaining water quality that can support larvivorous fish. *Culex*, *Coquillettidia*, *Mansonia*, and *Anopheles* mosquitoes are often produced in these habitats.

Pastures and agricultural lands are enormous mosquito producers, frequently generating huge broods of *Aedes*, *Psorophora*, and *Culex* mosquitoes. Improved drainage is one effective tool for source reduction in such habitats. The second is the use of efficient, precision irrigation practices that will result in less standing water for those agricultural areas that require artificial watering.

In coastal areas with extensive coastal salt marshes, there can be tremendous production of *Aedes* mosquitoes, making coastal human habitation virtually impossible. Several source reduction efforts can greatly reduce salt-marsh mosquito production through high-to mid-intensity management that relies upon artificial manipulation of the frequency and duration of inundation.

Biological Control Agents. The use of biological organisms or their byproducts to combat pest insects, such as mosquitoes, is termed biological control, or biocontrol. Biocontrol is utilization of parasites, predators, and pathogens to regulate pest populations. Generally, this definition includes natural and genetically modified organisms and means that the agent must be alive and able to attack the mosquito. The overall premise is simple: Biocontrol agents that attack mosquitoes naturally are grown in the lab and then released into the environment, usually in far greater numbers than they normally occur, and often in habitats that previously were devoid of them, so as to control targeted mosquito species.

One advantage of biocontrol agents is host-specificity which affords minimal disturbance to non-target species and to the environment. However, it is this specificity and the cost of commercializing biocontrol agents that deter development of biocontrol agents. In addition, utilization of biocontrol requires increased capital outlay and start up costs as well as increased training requirements for personnel.

Biocontrol should be considered a set of tools that a mosquito control program can use when it is economically feasible. When combined with conventional chemicals and physical control procedures, biocontrol agents can provide short and, occasionally, long-term control. Biocontrol, as a conventional control method, should aim at the weakest link of the life cycle of the mosquito. In most cases, this is the larval life stage.

Mosquitofish (*Gambusia affinis*) are currently the most extensively used biocontrol agent. These fish, which feed on mosquito larvae, can be placed in a variety of permanent and semi-permanent water habitats. Differences of opinion exist on the utility and actual control benefits derived from *Gambusia* implementation in an integrated pest management program with results reported from excellent control to no control at all. Recently, concerns over placing *Gambusia* in habitats where other fish species assemblages are threatened have arisen. Care must be taken in placement of this cosmopolitan species in areas where endemic fish species are sensitive to further environmental perturbation. Additionally, use of endemic fish species in these areas of concern deserves greater attention. An example of this is *Rivulus* fish species. The potential of Rivulus as mosquito predators is currently being evaluated in saltwater habitats, especially in Brevard County, Florida.

In some aquatic habitats, fish function as an excellent mosquito biocontrol mechanism. These typically are permanent habitats where *Culex* and *Anopheles* are the primary mosquito residents and where the mosquito densities are not excessive. However, in habitats such as salt marshes fish are unable to control the sudden explosion of larvae produced by rainfall or rising tides. Here, the mosquito population numerically exceeds what the fish can consume during the brief immature mosquito developmental period. In salt marshes, fish must rely on things other than mosquito larvae for their nutritional needs most of the time, simply because there may be long delays between hatches of larvae. Mosquito larvae present an abundant food source, but only for a few days during their rapid development.

Species of predacious mosquitoes in the genus *Toxorhynchites* have been studied in a variety of urban areas for control of container-inhabiting mosquitoes, such as the Asian tiger mosquito (*Ae. albopictus*). *Toxorhynchites* mosquitoes also affect mosquito populations that develop in the treehole environment; however, their introduction into urban container habitats has proven unsuccessful.

In specific containers, *Toxorhynchites* may consume a large number of prey mosquito larvae, such as *Aedes aegypti* and *Ae. albopictus*. However, this predator does not disperse well enough to impact the vast number of natural and artificial containers used by these mosquitoes. Additionally their life-cycle is two to three times that of their prey making it impossible for them to keep up with the other more rapidly developing mosquitoes.

Another group of biocontrol agents with promise for mosquito control is the predacious copepods (very small crustaceans). Copepods can be readily mass reared, are easily to delivered to the target sites, and perform well when used with insecticides.

Birds and bats are often promoted as potential biocontrol agents of adult mosquitoes. However, while both predators eat adult mosquitoes, they do not do so in sufficient amounts to impact the mosquito populations. Mosquitoes provide such a small amount of nutrition that birds or bats expel more energy pursuing and eating mosquitoes than they derive from them. They are not a primary food source for these predators. Additionally, with mosquito flight behavior being crepuscular they are not active during the feeding periods of most birds. While bats are active during the correct time period, they simply cannot impact the massive numbers of adult mosquitoes available.

Bio-rational products exploit insecticidal toxins found in certain naturally occurring bacteria. These bacteria are cultured in mass and packaged in various formulations. The bacteria must be ingested by mosquito larvae so the toxin is released. Therefore bio-rational products are only effective against larvae since pupae do not feed. The bacteria used to control mosquito larvae have no significant effects on non-target organisms. The possibility of creating a new invasive species by the introduction of biocontrols should be considered, evaluated, and avoided.

Pesticides. There are chemical and biological pesticide products registered for use against mosquitoes. Two biological pesticide products that are used against mosquito larvae singly or in combination are *Bacillus thuringiensis israelensis* (Bti) and *Bacillus sphaericus* (Bs). Manufactured Bti contains dead bacteria and remains effective in the water for 24 to 48 hours; some slow release formulations provide longer control. In contrast, Bs products contain live bacteria that in favorable conditions remain effective for more than 30 days. Both products are safe enough to be used in water that is consumed by humans. In addition to the biological pesticides, there are chemical pesticides for use against mosquitoes. As described below, once the determination is made to use pesticides to control mosquitoes, additional requirements under this general permit must be met.

Part 2.2.1.c. -- Pesticide Use

Conduct larval and/or adult surveillance in an area that is representative of the pest problem or evaluate existing larval surveillance data, environmental conditions, or data from adjacent area prior to each pesticide application to assess the pest management area and to determine when action threshold(s) is met. Pest surveillance is important for timing pest control properly and to evaluate the potential need for pesticide use for mosquito control. Understanding surveillance data may enable mosquito control Operators to more effectively target their control efforts. Decision-makers are required to conduct a surveillance program to minimize discharges from control activities. Surveillance is necessary not only to establish pests' presence and abundance but also as an evaluation tool of the effectiveness of source reduction and chemical control activities. Furthermore, surveillance should be used as an indicator of the need for additional chemical control activities based on pre-established criteria related to population densities in local areas.

Larval surveillance involves routine sampling of aquatic habitats for developing mosquitoes. The primary tools used to determine larval densities and species composition are a calibrated dip cup and/or a bulb syringe for inaccessible areas such as treeholes. The counts may be expressed as the number of immature (larvae and pupae) mosquitoes per dip, per unit volume, or per unit surface area of the site. However, due to natural mortality from environmental factors, disease and predators, larval dip counts do not provide an accurate indication of the potential adult population. Nevertheless, larval counts do indicate when chemical larval control measures are warranted.

Adult surveillance is a key component of Pest Management Measures. Adult surveillance can be conducted using a variety of methods including but not limited to CDC traps, New Jersey light traps, resting site traps, egg oviposition traps, vehicle traps, and landing count rates. Mosquito control Operators should use a variety of the available traps as adults are attracted to different traps depending on their species, sex, and physiological condition. Trapped adults provide information about local species composition, distribution, and density. In addition, the need for adulticide application may also be established through the number and distribution of service requests received from the public. Collection data also provide feedback to the mapping and planning component of the integrated pest management program as well as to its effectiveness and also serve to identify new sources of mosquitoes or identify recurring problem sites.

Disease surveillance, where practical, is also a key component of Pest Management Measures. Detecting antibodies in "sentinel" chicken flocks, equine cases, and testing dead birds and adult mosquitoes for infections are all used to determine whether disease is being transmitted in an area. Mosquito and vector control agencies also may test mosquitoes for viruses in their laboratories. Although generally less sensitive than sentinel chickens, mosquito infections may be detected earlier in the season than chicken seroconversions and therefore provide an early warning of virus activity. However, disease surveillance is not applicable to all mosquito control programs. In the absence of a dedicated disease surveillance program, mosquito control Operators should stay informed of arboviral occurrence or potential for occurrence in their control areas as determined by local, state, and/or national public health agencies.

Larval surveillance involves routine sampling of aquatic habitats for developing black flies. Larval surveillance is primarily accomplished by collecting stream substrates (rocks, vegetation, etc.) and examining for larval and pupal occurrence. Due to the varied developmental sites for black larvae and their ability to move in streams relative to changes in flow patterns, quantitative sampling will vary from site to site and in many instances, particularly with continuously changing water levels, is not practical. Qualitative sampling is often used in lieu of quantitative sampling, as an indicator of egg hatch and to indicate the age distribution of developing larvae. Qualitative sampling alone when used in conjunction with historical occurrence data can provide a reliable indicator of the need to initiate control activities.

Adult surveillance for black flies may include sweep sampling, vacuum aspiration of adults, and the use of silhouette traps. Traps may be simple visual attractants or may be baited with artificial attractants (e.g., ocentol and CO_2). However, as different black fly species will respond differently in relation to different attractants, based on host preference, care must be used in selecting attractants that will provide a representative sample of the complete black fly spectrum present in any given location. Choice of adult sampling will in many cases be dictated

by historical occurrence of black flies in a given area. Regardless, surveillance data is a useful tool in providing feedback to the mapping and planning component of any Pest Management Measure.

Aside from surveillance data, Decision-makers may also evaluate environment conditions to assess the pest management area. For example, if the pest management area is known for pest development after flooding then Pest Management Measures may be needed after a rain storm.

Reduce the impact on the environment and on non-target organisms by applying the pesticide only when the action threshold(s) has been met. Operators must apply pesticide only as indicated by action thresholds for the pest management area. As noted above, action thresholds, established by the Decision-maker, help determine both the need for control actions and the proper timing of such actions. Timing pesticide application can reduce the impact on the environment and on non-target organisms.

In situations or locations where practicable and feasible for efficacious control, use larvicides as a preferred pesticide for mosquito or flying insect pest control when the larval action threshold(s) has been met. Operators may use larvicides, adulticides or a combination of both. However, when practicable and feasible, larviciding should be the primary method for mosquito control. Larviciding is a general term for the process of killing mosquitoes by applying natural agents or manmade pesticide products designed to control larvae and pupae (collectively called larvicides) to aquatic habitats. Larviciding uses a variety of equipment, including aerial, from boats, and on the ground, as necessitated by the wide range of breeding habitats, target species, and budgetary constraints. Applications can be made using high pressure sprayers, ULV sprayers, handheld sprayers, and back sprayers. However, larviciding is only effective when a high percentage of the mosquito production sites are regularly treated, which may be difficult and expensive.

There are advantages and disadvantages to aerial and ground larvicide applications. Ground larviciding allows application to the actual treatment area and consequently to only those micro-habitats where larvae are present. Therefore, ground larviciding reduces unnecessary pesticide load on the environment. However, ground applications often rely on in-the-field human estimates of the size of treatment areas and equipment output with a greater chance of overdosing or under-dosing. Ground larviciding is also impractical for large or densely wooded areas and exposes Applicators to greater risk of insecticide exposure.

Aerial larviciding application methods are generally used for controlling mosquito larvae present in large areas and areas that are inaccessible for ground application. However, failure to treat an entire area with good larvicide coverage can result in the emergence of large adult populations. In order to prevent poor site coverage, a global positioning system (GPS), where economically feasible, or site flagging are necessary to increase accuracy of the pesticide application coverage while minimizing the amount of larvicides being applied. Aerial application does provide easier calibration of equipment due to the fact that the target area is generally mapped and the material is weighed or measured when loading. However, cost of aerial application is higher than ground application (i.e. additional personnel for flagging or expensive electronic guidance systems) and also requires special FAA licenses, training of staff, and additional liability insurance. In addition, aerial larviciding has greater potential for non-target impacts.

Bacillus thuringiensis var israelensis (Bti) is the primary larvicide used for black fly control in the United States. Bti is a gram positive, aerobic, spore-forming bacterium that produces protoxins in the form of parasporal protein crystals. In the alkaline digestive tract of black flies and mosquitoes, the protoxins become activated into highly toxic delta-endotoxins. The endotoxins cause a rapid breakdown in the lining of the mid-gut and necrosis of skeletal muscles, resulting in paralysis and mortality of target insect pests. Bti is nontoxic to most non-target organisms due to their acidic digestive systems and lack of suitable tissue receptor sites.

To minimize pesticide discharges into Waters of the United States, Operators must apply larvicides as needed for source reduction as indicated by the action threshold in situations or locations where it is practicable and feasible to do so. The action threshold may be based on occurrence of adults (current or historical) and/or larval sampling of stream substrates for immature black flies. Surveillance is also a valuable tool for assessing the effectiveness of larval control activities.

Larvicides may be applied to streams using either ground or aerial equipment. Choice of equipment is largely dictated by stream size and accessibility. Application equipment may include backpack sprayers, boats equipped with sprayers or metered release systems, helicopters or fixed wing aircraft. The amount of insecticide required to treat a stream should be based on the desired dosage and the stream discharge. Stream discharge is calculated by determining the average width and depth of the stream and the stream velocity (discharge = width (m) x depth (m) x velocity (m/s)). Proper calibration of insecticide delivery based on discharge is necessary to ensure complete coverage throughout the water column in order to expose all larval habitats to an effective insecticide dose.

A larvicide is applied across the stream width for the time specified by the application rate. The point of application should be far enough upstream from the larval habitat to ensure proper insecticide dispersal in the water passing over the treatment area. Operators should determine the effective downstream carry (maximum distance at which at least 80% larval control is achieved) of the insecticide suspension. By determining downstream carry, black fly control Operators can limit the number of applications necessary to treat any given stream and thereby reduce pesticide discharges into Waters of the United States.

In situations or locations where larvicide use is not practicable or feasible for efficacious control, use adulticides for mosquito or flying insect pest control when the adult action threshold(s) has been met. Chemical pesticide applications for adult mosquitoes, adulticiding, is the most visible and commonly used form of mosquito control. Adulticide applications may be used for nuisance or disease vectoring mosquitoes. Adulticiding consists of dispersing an insecticide as a space spray into the air column, using ground or aerial equipment, which then remains suspended in the air column through the habitat where adult mosquitoes are flying. Any mosquito adulticiding activity that does not follow reasonable guidelines, including timing of applications, avoidance of sensitive areas, and strict adherence to the pesticide label, risks affecting non-target insect species.

Operators must ensure that the adulticide applications are made only when necessary by determining a need in accordance with specific criteria that demonstrate a potential for a mosquito-borne disease outbreak, or numbers of disease vector mosquitoes sufficient for disease

transmission, or a quantifiable increase in numbers of pestiferous mosquitoes. To determine the need for adulticide application, at least one of the following criteria should be met and documented by records: 1) when a large population of adult mosquitoes is demonstrated by either a quantifiable increase in, or a sustained elevated mosquito population level as detected by standard surveillance methods, 2) where adult mosquito populations build to levels exceeding community standards (e.g., 25 mosquitoes per trap night or 5 mosquitoes per trap hour during crepuscular periods), and/or 3) when service requests for arthropod control from the public have been confirmed by one or more recognized surveillance methods.

The most common forms of adulticiding are ultra-low volume spray (ULV) and thermal fogging. Ground adulticiding is almost exclusively conducted with ULV equipment and is the most common method used to control mosquitoes. Ground adulticiding can be a very effective technique for controlling most mosquito species in residential areas with negligible non-target effects.

Aerial adulticiding is a very effective means of controlling adult mosquitoes, particularly in inaccessible areas, and may be the only means of covering a very large area quickly in case of severe mosquito outbreaks or vector borne disease epidemics. Aerial adulticide applications are made using either fixed wing aircraft or rotor craft. Application is generally as ULV spray but some thermal fogging still occurs.

Adulticide application has its own set of conditions that determine success or failure. The application must be at a dosage rate that is lethal to the target insect and applied with the correct droplet size. Whether the pesticide application is ground or aerially applied, it must distribute sufficient insecticide to cover the prescribed area with an effective dose. Typically with ground applications, vegetated habitats may require up to three times the dosage rates that open areas require. This is purely a function of wind movement and its ability to sufficiently carry droplets to penetrate foliage. In addition, aerial application is dependent upon favorable weather conditions.

Environmental conditions may also affect the results of adulticide application. Wind determines how the ULV droplets will be moved from the output into the treatment area. Conditions of no wind will result in the material not moving from the application point. High wind, a condition that inhibits mosquito activity, will quickly disperse the insecticide over too wide an area but at a diluted rate too low to effectively control pests. Light wind conditions (< 10 mph) are the most desirable because they move the material through the treatment area and are less inhibiting to mosquito activity. Thermal fogs perform best under very light wind conditions.

ULV application should be avoided during hot daylight hours. Thermal conditions, particularly temperature inversion, will cause the small droplets to quickly rise, moving them away from mosquito habitats. Generally, applications are made after sunset and before sunrise, depending upon mosquito species activity. Some mosquitoes (*Culex* and *Anopheles*) are most active several hours after sunset, while others (*Ae. aegypti* and *Ae. albopictus*) are more active during the daytime, and if these species are the targets, application should be made during the period of highest activity for the target species, provided that meteorological conditions are suitable for application (seldom during daylight hours).

One notable exception to applications made when mosquitoes are up and flying is a residual barrier treatment application. Barrier applications are based on the natural history and behavioral characteristics of the mosquito species causing the problem. Barrier applications use a residual material and are generally applied with a powered backpack sprayer to preferred resting areas and migratory stops in order to intercept adult mosquitoes hunting for blood meals. Barrier applications are often applied during daylight hours as a large-droplet liquid application and are designed to prevent a rapid re-infestation of specific areas, such as recreational areas, parks, special-event areas, and private residences. Barrier applications can help provide control of nuisance mosquitoes for up to one week or longer.

Pesticide control of black flies in the United States historically relied upon both larvicides and adulticides. However, adulticide use against black fly populations is no longer a common practice. As adult black flies are seeking blood meals during the daytime, adulticide application coincides with human activity, so daytime application is no longer a standard control procedure. One reason for this change is due to environmental factors associated with daytime adulticide application, particularly thermal inversions, which cause adulticide application for black fly control to be ineffective. Furthermore, as only adults directly contacted by the adulticide application are killed, with no residual activity against other adults immigrating to the treatment area, adulticide applications are both ineffective and expensive. For these reasons, larvicides which target the immature stages before development of the pestiferous adult are now the primary means of black fly control in the United States.

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EPA recommends the following sources for additional information on Pest Management Measures for mosquito control.

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State of New Mexico. 2008. Philosophy of Mosquito Control. http://www.health.state.nm.us/ERD/HealthData/documents/PhilosophyofMosquitoControl2008_000.pdf

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Recommended Black Fly Control References

EPA recommends the following sources for additional information on Pest Management Measures for black fly control:

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2.2.2. Weed and Algae Pest Control

Background

Weeds and algae that negatively affect aquatic biodiversity, human health, and economic stability are considered to be pests. Weeds and algae can decrease populations of native aquatic species including threatened and endangered species. Weeds and algae can reduce aquatic biodiversity by preventing desirable species growth and unbalancing desirable aquatic species populations and development. Social, economic, and human health are all affected by a lower aesthetic appeal of a water bodies, an increased cost of agricultural irrigation water, and an increase in the risk of human diseases by providing ideal vector breeding grounds. In addition, the reduction in the utility of water can have social and economic impacts due to reduced hydroelectric operations, impeded opportunity for recreational activities (e.g., fishing, boating, and swimming), and disruption of water transport (e.g., agricultural irrigation) to name a few. As a result, if weeds and algae become established and impede the environmental stability and

use goals for a body of water, control measures will be necessary. Pest control may be necessary before the pests become established.

The requirements in Part 2.2.2, apply to pesticide discharges associated with management of weeds, algae, and plant pathogens in water and water's edge (including near the water), including ditches and/or canals. Most aquatic plants and algae are largely beneficial to water quality, especially when present in the appropriate densities. However, overabundant native algae and aquatic vegetation, as well as introduced, exotic species can decrease water quality and utility. Dense plant or algae growth can interfere with recreational activities (e.g., fishing, boating, and swimming), disrupt water transport, reduce aquatic biodiversity by preventing desirable plant growth and unbalancing fish populations, lower the aesthetic appeal of a water body, and increase the risk of human diseases by providing ideal vector breeding grounds.

Algae

Algae are non-vascular plant that do not have true roots, stems, leaves, or vascular tissue and have simple reproductive systems. Some macroscopic algae may resemble a plant in appearance. Algae may occur in the sea or freshwater. Algae are an important aquatic food source for many animals. However, excess algae growth such as algae blooms, frequently caused by unbalanced or elevated nutrients, can be damaging to aquatic ecosystems. Control options include mechanical, biological, and chemical methods.

Weeds

Weeds include floating, emergent, or submerged plants that negatively impact the quality and utility of Waters of the United States. Weeds also include unwanted vegetation, including invasive species, at water's edge, including near the water and vegetation in or near Waters of the United States that are not always "wet" (eg, ephemeral streams, seasonal waters). Aquatic systems need plant materials as an important part of the systems ecology; however, when vegetation becomes established to the point of impeding the use goals for a body of water, control measures will become necessary. As a part of such aquatic weed control programs Pest Management Measures should consider mechanical, biological, and/or chemical controls. Details for developing an aquatic weed pest management measures can be found in the document *Aquatic Plant Management, Best Management Practices in Support of Fish and Wildlife Habitat* (Getsinger et al. 2005).

The appropriate type of control for weeds and algae is dictated by the biology of the target species and by environmental conditions and concerns for a specific area. Numerous Pest Management Measures are used to reduce the impact of weeds and algae, but an integrated pest management should be the basis for any pest control program. This is a comprehensive approach for managing pest populations using a variety of control methods.

Plant Pathogens

Plant pathogens are microorganisms that cause plant disease. Plant pathogens can be fungi, bacteria, viruses, mycoplasmas or nematodes. Each has a different life cycle which includes an infectious stage. Most pathogens are host-specific to a particular plant species, genus,

or family. Some diseases, such as the powdery mildews, produce similar symptoms on different plants. However, the fungi involved are usually host-specific. (Ohio State University Extension)

Fungi is one group of plant pathogens. They cause plant diseases such as rusts, smuts, and mildews. Fungal spores may be actively or passively released for dispersal by several effective methods (air dispersal, rain splash, flowing water dispersal, and forceable release). The function of some spores is not primarily for dispersal, but to allow the organisms to survive as resistant cells during periods when the conditions of the environment are not conducive to growth. Most phyla are terrestrial in origin, although all major groups have invaded marine and freshwater habitats. Wherever adequate moisture, temperature, and organic substrates are available, fungi are present. Although we normally think of fungi as growing in warm, moist forests, many species occur in habitats that are cold, periodically arid, or otherwise seemingly inhospitable. It is important to recognize that optimum conditions for growth and reproduction vary widely with fungal species. Fungi can be controlled using chemical, biological, and cultural practices.

Bacteria are single celled organisms that can cause many plant diseases (such as fire-blight, canker, and leaf spots). The infected plant can suffer significant yield losses or die prematurely. Bacterial diseases can be managed by chemical, biological or cultural practices.

Nematodes are simple, multi-cellular organisms that look like worms. They are soft-bodied (no skeleton) non-segmented round worms. Most nematode species that attack plants are microscopic. Plant parasitic nematodes may attack the roots, stem, foliage, and flowers of plants. Nematodes can be controlled by chemical, physical, or biological methods.

***Part 2.2.2.a* -- Identify the Problem**

Prior to the first pesticide application covered under this permit that will result in a discharge to Waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, any Decision-maker who is or will be required to submit NOI must do the following for each pest management area, as defined in Appendix A. Decision-makers must identify the pest problem in their pest management area prior to the first application covered under this permit. Knowledge of the pest problem is an important step to developing Pest Management Measures. Re-evaluation of the pest problem is also important to ensure Pest Management Measures are still applicable. Decision-makers must identify the pest problem at least once each calendar year prior to the first application for that calendar year.

Identify areas with pest problems and characterize the extent of the problems, including, for example, water use goals not attained (e.g. wildlife habitat, fisheries, vegetation, and recreation). Decision-makers must be well-acquainted with the unique regional conditions of their sites and available Pest Management Measures for controlling the pest present. Intended use goals for the water bodies that are being impeded because of nuisance pest infestation must also be considered based on the control site. The use of the best available mapping information to aid in identifying the problem areas is suggested. Mapping may include aerial photo assessments, topographic maps, and satellite imagery where available and/or practicable. Mapping can be essential to identify problem areas which can and cannot be controlled using non-pesticide preventative measures (e.g., mechanical control). Mapping can

also be used in plotting the regional desired pest, as well as water use goals and complaints or reports of weeds and algae from the public.

Identify target pest(s). Positive identification of the pest is required because many pests within the same genera may require different levels and types of Pest Management Measures. Pest identification is important when determining the best Pest Management Measures for each pest and for determining application areas. Decision-makers should develop Pest Management Measures based on identification of the targeted pest which occur in their area.

Identify possible factors causing or contributing to the pest problem (e.g., nutrients, invasive species, etc). While there may not be reasonable means to control and/or stop the introduction and occurrence of some nuisance pest infestations, the identification of possible sources (e.g., outflows from other water systems/bodies) may help in reducing the need for pesticide. Potential weed and algae sources such as changes in nutrient levels or accidental or intentional introduction of exotic species must be identified.

Establish any pest- and site-specific action threshold, as defined in Appendix A, for implementing Part 2.2.2b. Any data and/or information regarding pest can be used to establish an action threshold. An action threshold must be established.

In the event there are no data for the pest management area in the past calendar year, use other available data as appropriate to meet the permit conditions in Part 2.2.2.a. Decision-makers may use historical data or neighboring district data to identify the pest and establish action thresholds.

Part 2.2.2.b -- Pest Management Options

Prior to the first pesticide application covered under this permit that will result in a discharge to Waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, any Decision-maker who is or will be required to submit an NOI must select and implement efficient and effective means of Pest Management Measures that minimize discharges resulting from the application of pesticides to control pests. In developing the Pest Management Measures for each pest management area, the Decision-makers must evaluate the following management options, including a combination of these management options, considering impact to water quality, impact to non-target organisms, feasibility, and cost effectiveness: No action; Prevention; Mechanical/physical methods; Cultural methods; Biological control agents; and Pesticides. Decision-makers must evaluate management options and implement Pest Management Measures to minimize pesticide discharges into Waters of the United States prior to the first pesticide application covered under this permit. As noted above, combinations of various management options are frequently the most effective Pest Management Measures over the long term. The goal should be to emphasize long-term control rather than a temporary fix. Decision-makers must reevaluate every year prior to the first pesticide application for that calendar year. All Pest Management Measures must be implemented in a manner that reduces impacts to non-target species. The following describes the management options that must be evaluated.

<u>No Action</u>

No action is to be taken, although pest problem has been identified. This may be appropriate in cases where, for example, available pest management options may cause secondary or non-target impacts that are not justified, no available controls exist, or the pest population is stable at a level that does not impair water body uses.

Prevention

Preventing introductions of possible pest is the most efficient way to reduce the threat of nuisance species (ANS Task Force, 2009). Identifying primary pathways of introduction and actions to cut off those pathways is essential to prevention. Through a better understanding of the transportation and introduction of pest, private entities (aquaculture) and the public have the necessary knowledge to assist in local pest control by reducing conditions that encourage the spread of pest in their immediate surroundings. For example, recreational water users provide a pathway of unintentional introductions. Increasing public awareness of weeds and algae, their impacts, and what individuals can do to prevent their introduction and spread is critical for prevention. Other examples of prevention include: better design of water holding sites, better management and maintenance of potential problem sites, and volunteer removal of pest (e.g., hand weeding). Monitoring and detection also play important roles in the prevention of the spread and introduction of weeds and algae.

Mechanical or Physical Methods

Mechanical control techniques will vary depending on the pest. Examples include dewatering, pressure washing, abrasive scrubbing, and weed removal by hand or machine. Mechanical and biological controls will be the appropriate method in some cases, or a part of a combination of methods. In some instances, the need for chemical pesticide use in and adjacent to the affected habitat can be reduced or virtually eliminated with proper execution of Pest Management Measures.

Cultural Methods

Cultural techniques include the use of pond dyes and water-level drawdown. Use pond dyes to manage filamentous algae and submersed (underwater) vegetation. Several pond colorants and one or two dyes are EPA-registered for weed control. Pond dyes and colorants can be effective if there is little water outflow from the pond. Dyes and colorants intercept sunlight needed by algae and other underwater plants for photosynthesis. Therefore, they are generally ineffective on floating plants like duckweed and water lilies and emergent (growing above the surface) plants like cattails and bulrushes. Dyes and colorants are nontoxic and do not kill the plants, and they are safe for use in ponds for irrigation, fishing and livestock. However, they are not intended for use in large lakes with a lot of water flow or lakes used for public water supplies.[6]

Biological Control Agents

[6] http://www.grounds-mag.com/mag/grounds_maintenance_weeds_overboard/

Biological control of weeds and algae may be achieved through the introduction of diseases, predators, or parasites. While biological controls generally have limited application for control of weeds and algae, the Operator should fully consider this option in evaluating pest management options.

Pesticides

Aquatic herbicides are chemicals specifically formulated for use in water to kill or control aquatic plants. Aquatic herbicides are sprayed directly onto floating or emergent aquatic plants as well as plants at or near the water's edge or are applied to the water in either a liquid or pellet form. Systemic herbicides are capable of killing the entire plant. Contact herbicides cause the parts of the plant in contact with the herbicide to die back, leaving the roots alive and able to regrow. Non-selective, broad spectrum herbicides will generally affect all plants that they come in contact with. Selective herbicides will affect only some plants.[7]

Part 2.2.2.c. -- Pesticide Use

Conduct surveillance in an area that is representative of the pest problem prior to each pesticide application to assess the pest management area and to determine when the action threshold(s) is met. Often, each weed and algae and pest management area warrants a different Pest Management Measures tailored to the regional conditions. The Pest Management Measures should consist of combinations of mechanical, biological, and/or pesticidal control methods. All Pest Management Measures must be conducted in a manner that minimizes impacts to non-target species.

Decision-makers should apply chemical pesticides only after considering the alternatives and determining those alternatives not to be appropriate Pest Management Measures. Also, Decision-maker should conduct surveillance (e.g., pest counts or area survey) prior to application of pesticides to determine when the action threshold is met and necessitates the need for implementing Pest Management Measures.

Surveillance may include the relatively sophisticated transect method used in ecological studies to evaluate species distribution, or it may consist of simply conducting visual observations in the treated area to verify the eradication or reduction in populations of weeds and algae following pesticide application (Getsinger et al. 2005, pp 23-25).

Reduce the impact on the environment and non-target organisms by applying the pesticide only when the action threshold has been met. Operators must apply pesticide only as indicated by action thresholds for the pest management area. As noted above, action thresholds help determine both the need to implement Pest Management Measures and the proper timing of such actions. Timing pesticide application can reduce the impact on the environment and on non-target organisms.

[7] http://www.ecy.wa.gov/programs/wq/plants/management/aqua028.html

Environmental factors such as temperature and dissolved oxygen content, as well as biological factors such as stage of growth should be considered when deciding on application timing. Partial site pesticide applications over time may be considered to reduce risk. Pesticide application must be limited to the appropriate amount required to control the target pests. Methods used in applying pesticides must reduce the impact to non-target species.

Recommended Weed and Algae Control References

EPA recommends the following sources for additional information on Pest Management Measures for weed and algae control:

Aquatic Nuisance Species Taskforce. Online: http://www.anstaskforce.gov/default.php.

Getsinger, K., Moore, M. D., Layne, C. P., Petty, D. G., L, S., Sprecher, Dibble, E. D., Karcas, E., Maceina, M., Mudrak, V., Lembi, C., Madsen, J. D., Stewart, R. M., Anderson, L., Haller, W., Confrancesco, A., Newman, R., & Nibling, F. (2005). Aquatic Plant Management Best Management Practices in Support of Fish and Wildlife Habitat. Aquatic Ecosystem Restoration Foundation. Lansing, MI.

2.2.3 Animal Pest Control

Background

Animal Pests, such as fish, lampreys, and mollusks, negatively affect aquatic biodiversity, human health, and economic stability. Aquatic nuisance animals decrease populations of native aquatic species including threatened and endangered species. Aquatic nuisance animals can reduce aquatic biodiversity by preventing desirable species growth and unbalancing desirable aquatic species populations and development. Social, economic, and human health are all affected by a lower aesthetic appeal of water bodies, an increased cost of agricultural irrigation water, and an increase in the risk of human diseases by providing ideal vector breeding grounds. In addition, the reduction in the utility of water can have social and economic impacts due to reduced hydroelectric operations, impeded opportunity for recreational activities (e.g., fishing, boating, and swimming), and disruption of water transport (e.g., agricultural irrigation), to name a few. As a result, if or when animal pests become established and impede the environmental stability and use goals for a body of water, implementation of Pest Management Measures will become necessary. Animal aquatic pests also include insects, amphibians, and other animals that spend part or all of their life cycle at water's edge, including near the water, as well as in or near Waters of the US that are not always "wet" (eg, ephemeral streams, seasonal waters).

The requirements in this Part apply to pesticide discharges associated with management of animal pest including fish, lampreys, insects, mollusks, and microorganisms. Animal pest control includes management of nuisance species in Waters of the United States including lakes, ponds, rivers, estuaries, and streams. Pest Management Measures for animal pest control should consider mechanical, biological, and chemical controls. Details for identifying animal pests and developing Pest Management Measures can be found online through the Aquatic Nuisance Species Taskforce (http://www.anstaskforce.gov/).

Fish

Reasons for applications of piscicides in Waters of the United States for controlling nuisance species of fish may include, but are not limited to, restoration of threatened and endangered species; fish population management; restoration of native species; control of invasive species; and aquaculture. Pest Management Measures for fish should consider mechanical, biological, and chemical controls.

Lampreys

There are approximately 40 species of lamprey, which are aquatic vertebrates. The sea lamprey is an example of a problematic non-native parasitic species that feeds on native fish species in United States waters. Lampreys may be managed using lampricides that are applied directly to the Waters of the United States. Several effective management techniques such as mechanical and biological methods are available for lamprey control in addition to lampricides and should be considered when developing Pest Management Measures.

Mollusks

Nuisance mollusks including, but not limited to, zebra and quagga mussels, may cause damage to freshwater ecosystems, degrade drinking water, clog water-intake/discharge pipes for utilities and industries, and negatively impact commercial and recreational activities. Use of molluscicides is one of several methods of control for these aquatic nuisance animals; however, it is important to consider the impacts of mechanical, biological, and/or chemical pesticide use for control of mussels and other aquatic nuisance mollusk species.

Other Animals

There may be animals of concern in addition to fish, lampreys, and mollusks. Control of other animals including, but not limited to, crustaceans, amphibians, or insects found to be a nuisance and requiring management with mechanical, biological, and/or chemical pesticides are included in the requirements in Part 2.2.3.

The appropriate type of Pest Management Measures for animal pests is dictated by the biology of the target pest and by environmental conditions and concerns for a specific area. Numerous Pest Management Measures are used to reduce the impact of animal pests, but integrated pest management should be the basis for any pest control program. This is a comprehensive approach for managing pest populations using a variety of Pest Management Measures.

Part 2.2.3.a-- Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to Waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, any Decision-maker who is or will be required to submit an NOI must do the following for each pest management area, as defined in Appendix A. Decision-makers must identify the pest problem in their pest

management area prior to the first application covered under this permit. Knowledge of the pest problem is an important step to developing Pest Management Measures. Re-evaluation of the pest problem is also important to ensure Pest Management Measures are still applicable. Decision-makers must identify the pest problem at least once each calendar year prior to the first application for that calendar year

Identify areas with pest problems and characterize the extent of the problems, including, for example, water use goals not attained (e.g. wildlife habitat, fisheries, vegetation, and recreation). Decision-makers must be well-acquainted with the unique regional conditions of their sites and available Pest Management Measures for controlling the pest present. Intended use goals for the water bodies that are being impeded because of nuisance pest infestation must also be considered based on the control site.

The use of the best available mapping information to aid in identifying the problem areas is suggested. Mapping may include aerial photo assessments, topographic maps, and satellite imagery where available and/or practicable. Mapping can be essential to identify problem areas which can and cannot be controlled using non-pesticide preventative measures (e.g., mechanical control). Mapping can also be used in plotting the regional distribution of desired aquatic species, as well as water use goals and complaints or reports of pests from the public.

Identify target pest(s). Positive identification of the pest is required because many pest within the same genus may require different levels and types of Pest Management Measures. Animal identification is important when determining the best Pest Management Measures for each particular pest and for determining application areas. Decision-makers must develop Pest Management Measures based on identification of the targeted pest which occur in their area.

Identify possible factors causing or contributing to the problem (e.g., nutrients, invasive species). While there may not be reasonable means to control and/or stop the introduction and occurrence of some pest infestations, the identification of possible sources (e.g., outflows from other water systems/bodies) may help in minimizing the need for implementing Pest Management Measures. Potential factors which could lead to the establishment of animal populations such as accidental or intentional introduction of exotic species must be identified before Pest Management Measures are implemented.

Establish any pest- and site-specific action threshold, as defined in Appendix A, for implementing Part 2.2.3.b. An action threshold should be established before implementing Pest Management Measures. Any data and/or information regarding pest can serve as an action threshold.

In the event there are no data for the pest management area in the past calendar year, use other available data as appropriate to meet the permit conditions in Part 2.2.3.a. Decision-makers may use historical data or neighboring district data to identify the pest and establish action thresholds.

Part 2.2.3.b -- <u>Pest Management Options</u>

Prior to the first pesticide application covered under this permit that will result in a discharge to Waters of the United States, and at least once each year thereafter prior to the

first pesticide application during that calendar year, any Decision-maker who is or will be required to submit an NOI must select and implement efficient and effective means of Pest Management Measures that minimize discharges resulting from the application of pesticides to control pests. In developing the Pest Management Measures for each pest management area, the Decision-maker must evaluate the following management options, including a combination of management options, considering impact to water quality, impact to non-target organisms, feasibility, and cost effectiveness: No action; Prevention; Mechanical/physical methods; Biological control agents; and Pesticides.
Decision-makers are required to evaluate management options and implement Pest Management Measures to minimize pesticide discharges into Waters of the United States prior to the first pesticide application covered under this permit. As noted above, combinations of various management options are frequently the most effective Pest Management Measures over the long term. The goal should be to emphasize long-term control rather than a temporary fix. Decision-makers must reevaluate every year prior to the first pesticide application for that calendar year. All Pest Management Measures must be conducted in a manner that minimizes impacts to non-target species. The following describes the management options that must be evaluated.

No Action

No action is to be taken, although an animal pest problem has been identified. This may be appropriate in cases where, for example, available control methods may cause secondary or non-target impacts that are not justified or no available controls exist.

Prevention

Preventing introductions of possible nuisance species is the most efficient way to reduce the threat of aquatic nuisance animals (ANS Task Force, 2009). Identifying primary pathways of introduction and actions to cut off those pathways is essential to prevention. Through a better understanding of the transportation and introduction of animals, private entities (aquaculturists) and the public have the necessary knowledge to assist in local animal control by reducing conditions that encourage the spread of animals in their immediate surroundings. For example, recreational water users provide a pathway of unintentional introductions. Increasing public awareness of pests, their impacts, and what individuals can do to prevent their introduction and spread is critical for prevention. Other examples of prevention include: better design of water holding sites, better management and maintenance of potential problem sites, and volunteer removal of pest species (e.g., fishing). Monitoring and detection also play important roles in the prevention of the spread and introduction of pests.

Mechanical or Physical Methods

Mechanical and biological controls will be the appropriate methods in some cases, or a part of a combination of methods. Mechanical control techniques will vary depending on the pest. Examples include fishing, dewatering, netting, electrofishing, pressure washing, use of electric fences and abrasive scrubbing.

Biological Control Agents

Biological control of animals may be achieved through the introduction of diseases, predators, or parasites. While biological control generally has limited application for control of animals, Decision-makers should fully consider this option.

Pesticides

Chemical and biological pesticides such as lampricides, molluscides, insecticides, and piscicides, are registered for use to control animal pests. These pesticides are specifically formulated for use in water where aquatic nuisance animals occur. In some cases, pesticide use may impact non-target species. As described below, once the determination is made to use pesticides, additional requirements must be met.

Part 2.2.3.c. -- Pesticide Use

Conduct surveillance in an area that is representative of the pest problem prior to each application to assess the pest management area and to determine when the action threshold(s) is met. Often, each animal and pest management area warrants a different Pest Management Measures, tailored to the regional conditions. Pest Management Measures should consist of combinations of mechanical, biological, and/or pesticidal control methods. All Pest Management Measures must be conducted in a manner that minimizes impacts to non-target species.

Operators must apply chemical pesticides only after considering the alternatives and determining those alternatives not to be appropriate Pest Management Measures. In some instances, the need for chemical pesticide use in and adjacent to the affected habitat can be reduced or virtually eliminated with proper execution of alternative strategies and proper best management practices. If pesticides are used, they must only be used as needed as determined by an action threshold, and proper Pest Management Measures must be implemented, including use of the minimum effective application rate. Also, the Decision-maker must conduct surveillance (e.g., pest counts or area survey) prior to application of pesticides to determine when the action threshold is met that necessitates the need for implementing Pest Management Measures.

Surveillance may include the relatively sophisticated transect method used in ecological studies to evaluate species distribution, or it may consist of simply conducting visual observations in the treated area to verify the eradication or reduction in populations of aquatic nuisance animals following pesticide application (Getsinger et al. 2005, pp 23-25).

Reduce the impact on the environment and non-target organisms by evaluating site restrictions, application timing, and application method in addition to applying the pesticide only when the action threshold(s) has been met. The pest and site restrictions (water use, water movement, etc.) must be identified when choosing an appropriate pesticide. Environmental factors such as temperature as well as biological factors such as migration timing should be considered when deciding on application timing. Partial site pesticide applications over time may be considered to minimize risk to non-target organisms.

Pesticide application must be limited to the appropriate amount required to control the target pests. Methods used in applying pesticides must minimize the impact to non-target

species. For piscicides, chemical deactivation is currently required for all lotic (flowing water) environments. Management agencies typically work down the watershed in consecutive treatments as this will require the least amount of chemical deactivation. Most invertebrates repopulate treated areas through immigration (typically in the direction of flow); as such headwater streams/tributaries seem to be effective at accomplishing this. EPA also notes that not all piscicides are that harmful to invertebrate populations (e.g., antimycin is more selective for scaled fish). It can be difficult to know the point at which headwater streams are "fishless"; however, most fishery management agencies do not treat streams unless they are considered a refuge for target species.

Recommended Animal Pest Control References

EPA recommends the following sources for additional information on Pest Management Measures for animal control:

Aquatic Nuisance Species Taskforce. Online: http://www.anstaskforce.gov/.

Getsinger, K., Moore, M. D., Layne, C. P., Petty, D. G., L, S., Sprecher, Dibble, E. D., Karcas, E., Maceina, M., Mudrak, V., Lembi, C., Madsen, J. D., Stewart, R. M., Anderson, L., Haller, W., Confrancesco, A., Newman, R., & Nibling, F. (2005). Aquatic Plant Management Best Management Practices in Support of Fish and Wildlife Habitat. Aquatic Ecosystem Restoration Foundation. Lansing, MI.

2.2.4 Forest Canopy Pest Control

Background

The forest canopy is the uppermost level of the forest. It is composed of treetops, or the crowns of the trees. It provides habitat for animals and plants, some of whom live their entire lives in the canopy. Pests that threaten the health of the forest canopy must be controlled to maintain forest health. Forest canopy pest control programs are designed to integrate environment-friendly Pest Management Measures (e.g., sterile insect release, pheromone trapping, mating disruption, etc.) to reduce losses and pesticide use. But pesticide applications may aerially blanket large tracts of terrain to control an entire population of pests within a delimited geographic area. Forest canopies may also include the tops or crowns of immature trees, where pesticide application is necessary to control pests that live in or threaten these areas.

Forest canopy pest control programs included in this permit are treetop pesticide applications that may inadvertently expose Waters of the United States to direct, but limited, pesticide application. Forest canopy pest control can be directed at a variety of pests, but primarily insects. Forest canopy pest control programs are utilized to prevent habitat elimination/ modification, economic losses (e.g., habitat aesthetics, tree losses), quarantine pest outbreaks, and eradicate or prevent the spread of introduced invasive species. Therefore, forest canopy pest management programs provide environmental, economic, and quality of life benefits in the United States.

The type of forest canopy pest control is dictated by the biology of the target pest and by environmental conditions and concerns for a specific area. Forest canopy pest control programs

are primarily conducted at the state and federal level but may also be conducted at the local/community level.

Part 2.2.4.a -- Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to Waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application in that calendar year, any Decision-maker who is or will be required to submit an NOI must do the following for each pest management area, as defined in Appendix A. In order to reduce pesticide discharges into Waters of the United States associated with forest canopy pest control, it is important for Decision-makers to ensure proper problem identification. Problem identification is determined through pest identification, delineation of the extent and range of the pest problem, determination of the potential for pest problem expansion, and assessing the economic impact of failure to implement Pest Management Measures.

Establish any pest- and site-specific action threshold, as defined in Appendix A, for implementing Part 2.2.4.b. Decision-makers must develop action thresholds for the target pests prior to first pesticide application covered under this permit. The action thresholds must be re-evaluated at least once each calendar year. As noted in the general discussion above, an action threshold is a point at which pest populations or environmental conditions indicate that Pest Management Measures must be taken. Action thresholds help determine both the need for implementing Pest Management Measures and the proper timing of such actions. It is a predetermined pest level that is deemed to be unacceptable.

Identify target pest(s) to develop Pest Management Measures based on developmental and behavioral considerations for each pest. Pest identification is a key activity for implementation of a forest canopy pest control system. Pest identification should only be conducted by personnel with adequate training and experience with the pests. While numerous similar pests (insects and/or pathogens) may be present in any given location, only a few of the representative pest may constitute a threat which requires control activities. Through proper pest identification informed control decisions can be made based on the development biology of the pest (susceptible development stage), pest mobility (potential rate of spread), timing of selected Pest Management Measures, applicable control techniques, and most effective chemical pesticides for the target pests (insecticide class, resistance, etc.). Failure to identify pests can lead to unwarranted control activities and/or the need for chemical application with potential for discharges into Waters of the United States. Control for each specific pest is also predicated on the status of the pest as native recurring, quarantine restricted, or designated as an invasive species.

Identify current distribution of the target pest and assess potential distribution in the absence of Pest Management Measures. Control activities are warranted only after exact pest identification and delineation of the extent of the pest infestation. As forest canopy pest control can involve treating large expanses of forests, mapping is also an important component in identification of the problem. The distribution of the pest, usually insects, within the area of infestation can impact the selection of Pest Management Measures. In addition, mapping of the pest infestation will allow evaluation of the actual/potential spread of the infestation (e.g., pest biology, pest mobility, and host availability) and also serve as a tool to evaluate the effectiveness

of the Pest Management Measures. Mapping can also provide essential information for assessment of economic damages that can result from the current and potential pest infestation and failure to control the pest. Management decisions can thereby be based on cost/benefit evaluations based on the current and potential distribution of any pest.

The third component of problem identification is to determine the potential economic impact of not controlling the pest. By establishing economic thresholds, it is possible to determine pest action thresholds which warrant control activities. However, control decisions must take into account not only the projected economic impact of the current pest infestation but also the potential of the pest infestation to spread. Therefore, control decisions based on economic impact must in turn rely on proper pest identification, pest biology, and current and potential pest distribution.

In the event there are no data for the pest management area in the past calendar year, use other available data as appropriate to meet the permit conditions in Part 2.2.4.a. Decision-makers may use historical data or neighboring district data to identify the pest and establish action thresholds.

Part 2.2.4.b. -- Pest Management Options

Prior to the first pesticide application covered under this permit that will result in a discharge to Waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, any Decision-maker who is or will be required to submit an NOI must select and implement efficient and effective means of Pest Management Measures that minimize discharges resulting from the application of pesticides to control pests. In developing the Pest Management Measures for each management area, the Decision-maker must evaluate the following management options, including a combination of management options, considering impact to water quality, impact to non-target organisms, feasibility, and cost effectiveness: No action; Prevention; Mechanical/physical methods; Cultural methods; Biological control agents; and Pesticides. Pest control activities in forest canopy management programs may be warranted following problem identification and based solely on pest occurrence (e.g., quarantine pest, invasive species). However, in many instances control activities may only be necessary based on pest population distribution and/or pest densities. To minimize the need for pest control while also producing the best control results, Pest Management Measures appropriate for the specific problem site(s) must be developed. A site-specific management plan will consider biotic (e.g., plant and animal species community structure) and abiotic (e.g., environmental) factors. Combinations of various management options are frequently the most effective Pest Management Measures over the long term. The goal of Pest Management Measures in forest canopy pest control should be to emphasize long-term control rather than a temporary fix.

All Pest Management Measures must be conducted in a manner that minimizes impacts to non-target species. The following is a discussion of the relevant management options as they might be implemented for forest canopy pest control.

<u>No Action</u>

No action is to be taken, although a pest problem has been identified. This may be appropriate in cases where available control methods may cause secondary or non-target impacts or where aesthetic/ economic losses are not anticipated.

Mechanical/Physical Methods

Mechanical and biological controls will be the appropriate method in some cases, or a part of a combination of methods. In some instances, the need for chemical pesticide use in and adjacent to the affected habitat can be reduced or virtually eliminated with proper execution of alternative measures and proper best management practices.

Mechanical control techniques will vary depending on the pest. An example of mechanical control in a forest canopy would be egg mass removal (gypsy moth).

Cultural Methods

Cultural control methods are Pest Management Measures that make the habitat unsuitable for a pest. An example of a cultural method to manage pests of the forest canopy would be to select a different species of tree to plant, or to plant resistant varieties of trees. Maintaining the trees in good health to discourage pests is another method of cultural control.

Biological Control Agents

Biological control of forest canopy pests may be achieved through the introduction/enhancement of diseases, predators, or parasites. In addition, forest canopy pest control programs aimed specifically at insects may also utilize sterile insect release, mating disruption, and biological pesticides. While biological controls generally have limited applications for forest canopy pest control programs, they should be fully considered as an option in the development of Pest Management Measures. The latter two control approaches are often utilized when controlling for gypsy moth.

Pesticides

Several chemical and biological pesticides are available that may be used to reduce defoliation of the trees. These pesticides are typically used when pest populations are high and the action threshold has been reached. These products are aerially applied. As described below, once the determination is made to use pesticides, additional requirements must be met.

Part 2.2.4.c. -- Pesticide Use

Conduct surveillance in an area that is representative of the pest problem prior to each application to assess the pest management area and to determine when the pest action threshold is met. Decision-makers must apply pesticides only as needed as determined by pre-established criteria and pest action thresholds. Decision-makers must establish a pest action threshold that warrants pesticide application based on problem identification and pest surveillance. In order to establish pest densities and determine when pest action thresholds have been met, forest canopy pest control programs must include pest surveillance activities as an integral component of Pest Management Measures. Pest surveillance is necessary to detect the

presence (or confirm the absence) and magnitude of pest populations in a given location and precisely pinpoint zones of infestation. Surveillance activities will vary according to the pest (insect, weed, or pathogen) but in general should include observations of pest numbers, developmental stage of the current infestation, and biotic factors which would enhance development/expansion of pest populations (e.g., weather, crowding, predators, pathogens, etc.).

Pest surveillance will vary according to pest type and species. For insect pests, surveillance activities may include, but not be limited to, pheromone traps, sticky traps, light traps, defoliation monitoring. In some cases, traps used in surveillance activities have been developed to the extent that they alone provide adequate control of the targeted pest, thus eliminating the need for pesticide completely. Conversely, in the instance of quarantine pests or invasive species, pest identification alone may suffice to fulfill surveillance requirements and indicate need for control measures. Regardless, surveillance should take in to account local environmental conditions and projected environmental conditions which would support development and/or spread of the pest population and which would limit the choice or effectiveness of control activities.

It is also important to continue surveillance following control activities to assess Pest Management Measures efficacy and to monitor for new pests. Surveillance can determine if the current techniques are effective and whether additional Pest Management Measures are required, particularly pesticide application. Based on follow-up surveillance activity, Decision-makers can make informed decisions which serve to increase the effectiveness of their control programs and minimize the potential for pesticide discharges to Waters of the United States. Surveillance is necessary not only to establish the pest presence and their abundance but also as an evaluation tool of the effectiveness of chemical control activities. Furthermore, surveillance should be used as an indicator of the need for additional chemical control activities based on pre-established criteria related to population densities in local areas.

Reduce the impact on the environment and non-target organisms by evaluating the restrictions, application timing, and application methods in addition to applying the pesticide only when the action threshold(s) have been met. Forest canopy pest and site restrictions (water use, water movement, etc.) must be identified when choosing an appropriate pesticide. For instance with gypsy moth control a biological insecticide, Bacillus thuringiensis kurstaki, is usually selected. However, if endangered or threatened butterfly or moth species are in the area, a viral insecticide that specifically targets gypsy moth larvae will be considered. Environmental factors such as temperature, as well as biological factors such as migration timing should be considered when deciding on application timing. Partial site pesticide applications over time may be considered to minimize risk to non-target organisms. Pesticide application must be limited to the appropriate amount required to control the target pests. Methods used in applying pesticides should weigh the potential impact to non-target species.

Evaluate using pesticides against the most susceptible developmental stage. For forest canopy pests, pesticides should be selected that target the most susceptible life stage. Gypsy moth caterpillars are susceptible to control by chemical pesticides, or by ingestion of nucleopolyhedrosis virus occlusion bodies.

Recommended Forest Canopy Pest Control Reference

EPA recommends the following source for additional information on Pest Management Measures for forest canopy pest control:

Emily Grafton and Ralph Webb. Homeowner's guide to gypsy moth management. West Virginia University Extension Service.
http://www.nj.gov/agriculture/divisions/pi/pdf/GMguide.pdf

USDA. 2009. Gypsy Moth Program Manual.
http://www.aphis.usda.gov/import_export/plants/manuals/domestic/downloads/gypsy_moth.pdf

Kucera, Daniel and P. Orr. Spruce Budworm in the Eastern United States. U.S Department of Agriculture, Forest Service. Forest Insect and Disease Leaflet 160. Retrieved 3/12/09 at
http://www.na.fs.fed.us/spfo/pubs/fidls/sbw/budworm.htm

Michael, Jerry. 2004. Best Management Practices for Silvicultural Chemicals and the Science behind Them. Water, Air, and Pollution: Focus. 4(1), 95-117.

3. WATER QUALITY-BASED EFFLUENT LIMITATIONS

The CWA requires NPDES permits to include technology-based effluent limitations for all discharges, and then if necessary for a specific discharge, water quality-based effluent limitations (WQBELs). Permit writers are to assess whether the technology-based effluent limitations are protective of water quality standards, and if not, permit writers must also include WQBELs as necessary to ensure that the discharge will not cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality (see 40 CFR 122.44(d)). In developing WQBELs, permit writers must consider the potential impact of every proposed surface water discharge on the quality of the receiving water. Unlike individual permits that include requirements tailored to site-specific considerations, general permits, while tailored to specific industrial processes or types of discharges (e.g., from the application of pesticides), often do not contain site-specific WQBELs. Instead, in general, EPA includes a narrative statement that addresses WQBELs. In this permit the WQBEL is as follows:

> *All Operators must control discharges as necessary to meet applicable numeric and narrative state, territory, or tribal water quality standards, for any discharges authorized under this permit, with compliance required upon beginning such discharge.*
>
> *If at any time an Operator becomes aware (e.g., through self-monitoring or by notification from the state, tribe, or territory), or EPA determines, that a discharge causes or contributes to an excursion of any applicable water quality standards, the Operator must take corrective action as required in Part 6 and Appendix B, Section B.3, up to and including the ceasing of the discharge, if necessary.*

The first sentence includes the general requirement to control discharges as necessary to meet water quality standards, while the second sentence implements this requirement in more specific terms by imposing on Operators a responsibility to take corrective action in response to an excursion of applicable water quality standards, whether discovered by EPA or by the

Operator. Failure to take such corrective action is a violation of the permit. Additionally, the permit includes a provision, in Part 1.2.3, that specifies that EPA may determine that additional technology-based and/or water quality-based effluent limitations are necessary, or may deny coverage under this permit and require submission of an application for an individual NPDES permit, as detailed in Part 1.3.

Each Operator is required to control its discharge as necessary to meet applicable water quality standards. In general, EPA expects that compliance with the other conditions in this permit (e.g., the technology-based limitations, corrective actions, etc.) will result in discharges that are controlled as necessary to meet applicable water quality standards based on the cumulative effect of the following factors, which are described in more detail below:

(1) Under FIFRA, EPA evaluates risk associated with pesticides and mitigates unreasonable ecological risk. Compliance with FIFRA is assumed. (See Part III.1.5 of this fact sheet.)

(2) EPA evaluated national–scale ambient monitoring data, as well as the frequency of the identification of specific pesticides as the cause of water impairments, to assess whether pesticide residues are currently present in waters at levels that would exceed water quality standards. The monitoring data, although limited in scope, show that, in most samples, most pesticides were below ambient water quality criteria or benchmarks developed by EPA's Office of Pesticide Programs (OPP). For this assessment, ambient water quality criteria were available for 7 of the 83 analytes and one or more OPP benchmarks were available for 60 of the 83 analytes. For the small number of pesticides found in monitoring data to be present above such benchmarks, the evaluation, as summarized in Appendices B and C of this fact sheet, also documents risk mitigation actions taken by EPA (such as cancellation of pesticide uses) that EPA expects have reduced the levels of those pesticides in water.

(3) Technology-based effluent limitations in the PGP provide further protections beyond compliance with existing FIFRA requirements.

(4) Biological pesticides discharged to waters, by regulatory definition, do not work through a toxic mode of action. For chemical pesticides, the discharges covered under this permit are the residues after the pesticide has performed its intended purpose. Thus, the residue will be no higher than, and in many instances, lower than, the concentration of the pesticide as applied.

(5) The PGP excludes pesticide applications that result in discharges of any pesticide to (1) waters impaired for that pesticide or (2) any Tier 3 waters (i.e., outstanding national resource waters) except for pesticide applications made to restore or maintain water quality or to protect public health or the environment that either do not degrade water quality or only degrade water quality on a short-term or temporary basis.

In addition to the five factors identified above, before issuance, EPA permits require CWA §401 certification by states, territories, and tribes. The states, territories, and tribes included in this permit have reviewed the permit and certified that it will meet their water quality standards. In this process, some states, territories, and tribes have, in this process, added further conditions to ensure that water quality standards will be met. Part 9 of the permit includes those additional conditions so required by any state, territory, or tribe in areas where this permit is available.

This permit requires Operators to control discharges as necessary to meet applicable water quality standards. When the Operator or EPA determines a discharge will cause or contribute to an excursion above any WQS, including failure to protect and maintain existing designated uses of receiving waters, the Operator must take corrective action to ensure that the situation is eliminated and will not be repeated in the future. (See Part 6.0). If additional Pest Management Measures are required, EPA expects the Operator to vigilantly and in good-faith follow and document, as applicable, the process for Pest Management Measure selection, installation, implementation and maintenance, and cooperate to eliminate the identified problem within the timeframe stipulated in Part 6.0 of the PGP.

(1) <u>Under FIFRA, EPA evaluates risk associated with pesticides and mitigates unreasonable ecological risk.</u>

Background

EPA regulates the use of pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). In general, FIFRA authorizes EPA to register each pesticide product intended for distribution or sale in the United States. To register a pesticide, the Agency must determine that its use in accordance with the label will not cause "unreasonable adverse effects on the environment." (see, e.g., FIFRA sec. 3(c)(5)). FIFRA defines that term to mean, in part, "any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide" (FIFRA sec. 2(bb)). The "unreasonable adverse effects" standard requires EPA, in effect, to balance the human health and ecological risks of using a pesticide against its economic, social, human health, and ecological benefits. Pesticides are registered for sale and distribution only if EPA determines that the benefits outweigh the risks. In making decisions on whether to register a pesticide, EPA considers the use directions on proposed product labeling and evaluates data on product chemistry, human health, ecological effects, and environmental fate to assess the potential risks associated with the use(s) proposed by the applicants for registration and expressed on the labeling. Among other things, the Agency evaluates the risks to human health and the environment (including water quality) posed by the use of the pesticide.

As stated above, EPA reviews and approves pesticide product labeling. EPA implements risk mitigation measures identified through the risk assessment process by placing use restrictions and warnings on labeling to ensure the use of the pesticide (under actual use circumstances and commonly accepted practice) will not cause any "unreasonable adverse effects on the environment." It is a violation under FIFRA sec. 12(a)(2)(G) (FIFRA's "misuse" provision) to use a registered pesticide inconsistent with its labeling.

After a pesticide has been registered, changes in science, public policy, and pesticide use practices will occur over time. FIFRA, as amended by the Food Quality Protection Act of 1996, mandates a registration review program, under which the Agency periodically reevaluates pesticides to make sure that as the ability to assess risk evolves and as policies and practices change, all registered pesticides continue to meet the statutory standard of no unreasonable adverse effects to human health or the environment. The Agency is implementing the registration review program pursuant to Section 3(g) of FIFRA and will review each registered pesticide every 15 years to determine whether it continues to meet the FIFRA standard for

registration. Information on this program is provided at:
http://www.epa.gov/oppsrrd1/registration_review/.

Ecological Risk Assessment

The following is a discussion about the FIFRA risk assessment process with a focus on Ecological (specifically aquatic) Assessments. Persons seeking pesticide registrations bear the burden of demonstrating their products meet the statutory standard under FIFRA. As set forth in 40 CFR Part 158, applicants for pesticide registrations must provide EPA with a suite of product chemistry, residue chemistry, toxicity, environmental fate, and ecotoxicity studies to support an application for registration. To support outdoor uses, studies are required that provide information related to the environmental fate and transport of the chemical and that measure the acute and chronic toxicity to terrestrial and aquatic organisms. These studies, along with open literature that meet data quality guidelines, are the basis for the ecological risk assessments. The ecological risk assessment combines the results of an environmental exposure assessment and an ecological effect assessment for a pesticide active ingredient to produce a quantitative measure of potential risk.[8] A risk characterization is also presented to put the quantitative assessment of risk in the context of other lines of evidence, such as available monitoring data and incident reports, and to discuss uncertainties in the risk assessment. The quantitative and qualitative determination of potential ecological risk is independent of economic or other benefit considerations.

Aquatic Exposure Characterization

EPA estimates pesticide concentrations in aquatic environments to determine if exposure to a pesticide active ingredient is at a level that could cause unreasonable adverse effects to aquatic organisms. EPA estimates pesticide concentrations in water using peer-reviewed simulation modeling because there are not sufficient monitoring data to estimate exposure to aquatic organisms under all potential use conditions. When available, monitoring data are used to help characterize aquatic exposure.

EPA also estimates potential exposure from uses involving direct application to water. The model used for pesticides applied directly to water uses environmental fate data to simulate partitioning of the pesticide between the water column and bottom sediment in a standard rice paddy. This modeling is conservative because it does not simulate degradation of the applied pesticide, as would be necessary to estimate the amount of residue remaining after the pesticide product had performed its intended function. Depending on the rate of degradation, the initial concentration as estimated by the model could be much higher than the residual concentration remaining after pesticide application has been completed. Additionally, this modeling scenario is conservative because the resulting exposure estimate is the concentration in the paddy water itself, not taking into account dilution which would occur when paddy water is diluted by precipitation or when it is released into a receiving water body.

[8] As part of the risk assessment, EPA also examines available information to determine the need to expand beyond the focus on the active ingredient to consider pesticide formulation, inert ingredients, or degradates.

As discussed above, when available, EPA uses ambient water monitoring data as a line of evidence to characterize aquatic exposure in ecological and human health risk assessments. The United States Geological Survey (USGS) maintains several sources of pesticide monitoring data. These sources include the National Water Quality Assessment program (NAWQA), the Toxic Substances Hydrology Program, and the National Stream Quality Accounting Network (NASQAN). EPA sources of water monitoring data include STORET, a storage and retrieval database of national water quality information, the Safe Drinking Water Information System (SDWIS), Office of Water compliance monitoring data, and the USGS/EPA Reservoir Monitoring Program. In addition to the federal data sources, monitoring data are sometimes available from States, pesticide registrants, and the open literature.

These monitoring data are evaluated on a case-by-case basis to help characterize the likelihood, extent, and nature of pesticide concentration in water under current use practices and actual field conditions. EPA considers the locations and frequency of sampling, the analytical methods, the detection limits, and the purpose of the monitoring studies from which the data are derived when determining how such data will be incorporated into the FIFRA risk assessment and the usefulness of the monitoring data for an aquatic exposure assessment. For example, a monitoring study targeted to measure concentrations of a pesticide in a watershed with high agricultural use of that pesticide will not provide much insight on the potential exposure from its use as a mosquito adulticide. Similarly, a general survey of ambient water quality might not necessarily target specific pesticide use areas or the time of year when pesticide concentrations may be at their peak, and for this reason may not provide a reliable estimate of acute exposure. However, if monitoring data from such a study shows higher confirmed detections than estimated by modeling, the higher monitoring values typically would be used in the risk assessment.

In sum, EPA's screening level exposure estimates from simulation models are conservative, consistent with their intended use as a screen to identify pesticide use scenarios that do not pose a risk of concern, both because of the selected inputs used to generate them and the values from the model outputs that are selected for the FIFRA risk assessment. When ambient aquatic monitoring data are available for a given pesticide, monitored concentrations are usually lower than modeled concentrations and in many cases substantially lower. The next section describes the second portion of the risk assessment: effects.

Aquatic Effects

To determine if a pesticide is sufficiently toxic at its estimated exposure concentrations to cause unreasonable adverse effects in the environment, EPA reviews available ecotoxicity data. These data may come from a number of sources, including direct guideline study submissions required in support of registration, and open literature data retrieved through ECOTOX[9]. The typical assessment endpoints for pesticide ecological risk assessments are reduced survival from direct acute exposures and survival, growth, and reproductive impairment from direct chronic

[9] U.S. EPA. 2007. Ecotoxicity Database (ECOTOX) Mid-Continent Ecology Division, National Health and Environmental Effects Research Laboratory. U.S. Environmental Protection Agency, Office of Research and Development. http://cfpub.epa.gov/ecotox/.

exposures. As noted in the OPP Overview[10] document, which describes the process OPP uses to conduct ecological risk assessment under FIFRA, OPP evaluates other data on sublethal effects in addition to direct effects on survival, growth and reproduction.

In general, the current FIFRA data regulations require studies that include but are not limited to a suite of aquatic toxicity studies for effects characterization. These test requirements are defined for each chemical class by use category (40 CFR Part 158 Subpart D; Wildlife and Aquatic Organism data requirements; http://edocket.access.gpo.gov/cfr_2007/julqtr/40cfr158.490.htm) and are performed on a limited number of laboratory test organisms in the following broad taxonomic groupings.

- Freshwater fish,
- Freshwater invertebrates,
- Estuarine/marine fish,
- Estuarine/marine invertebrates, and
- Algae and aquatic plants.

Within each of these very broad taxonomic groups, the most sensitive acute and chronic toxicity value is selected from the all available test data, including open literature and registrant submissions. If additional toxicity data for more species of organisms in a particular group are available, the most sensitive toxicity values from all sources for other species/studies that meet data quality standards are used in the risk assessment[11]. Aquatic toxicity data are required for each active ingredient, but aquatic toxicity data are also required on the typical end use product for any pesticide that will be introduced directly to aquatic environments (40 CFR Part 158.630).

Risk Characterization

Risk characterization is the integration of effects and exposure characterization to determine the ecological risk from the use of the pesticide and the likelihood of effects on non-target species based on the pesticide-use scenarios. In FIFRA screening-level assessments, OPP relies on the deterministic risk quotient (RQ) method to compare estimated exposure to toxicity endpoints. Estimated environmental concentrations (EECs) derived in the exposure characterization are divided by acute and chronic toxicity endpoints identified in the effects characterization. Risk quotients are then compared to the Agency's Levels of Concern (LOCs). These LOCs are the Agency's interpretative policy and are used to analyze the potential risk to non-target organisms and the need to consider regulatory action. These criteria are used to indicate when a pesticide use as directed on the label has the potential to cause adverse effects on non-target organisms. If a risk of concern is identified, risk mitigation measures are considered.

Risk Mitigation

[10] U.S. EPA. 2004. Overview of the Ecological Risk Assessment Process in the Office of Pesticide Programs. Office of Prevention, Pesticides, and Toxic Substances. Office of Pesticide Programs. Washington, D.C. January 23, 2004. Support Document 1: Study Classification used by EFED in Data Evaluation Records (DERs) http://www.epa.gov/oppfead1/endanger/consultation/ecorisk-overview.pdf

[11] *Ibid* U.S. EPA 2004

EPA acknowledges that there are uncertainties in its pesticide risk assessments (see full discussion below), nonetheless the Agency reduces the risks of concern by imposing additional restrictions on the use of a pesticide to reduce pesticide concentrations in the aquatic environment. Mitigation measures may include limits on the amount and frequency that a pesticide may be applied, or the application methods may be restricted to limit off-site transport. Mitigation may also limit the geographical areas to which a pesticide can be applied or may include mandatory buffer distances from sensitive habitats. Mitigation measures are implemented through product labeling instructions, with which pesticide users are required to comply.

In some cases, EPA restricts the use of a pesticide so that levels of pesticide predicted by the model to reach water are below the relevant aquatic benchmarks (see Aquatic Benchmarks discussion below). In other cases, using the FIFRA risk-benefit balancing standard, EPA may permit the use of a pesticide even though estimated water concentration might exceed a relevant benchmark. In such cases, the decision incorporates consideration of the benefits of the pesticide use and other lines of evidence, such as any available National Recommended Water Quality Criterion for ambient water quality, concerning the conservativeness of the modeling assessment and available monitoring data.

Uncertainties with Risk Assessment and Mitigation

For the majority of pesticides, the Agency relies on simulation modeling to predict potential aquatic exposure following pesticide applications. There are uncertainties embedded in the FIFRA exposure assessment, for example, the extent to which the simulated scenario represents actual use conditions in terms of hydrologic vulnerability and the amount and frequency with which pesticides are applied. In order to account for the inherent uncertainty the Agency uses a combination of parameters and assumptions in the models that results in estimated potential exposure concentrations that are high-end and are not likely to underestimate actual aquatic exposure. This allows the Agency to identify pesticides that are not likely to pose a risk to aquatic life.

In the effects characterization under FIFRA, the lowest acute and chronic toxicity values from the most sensitive species tested in acceptable studies are used as the relevant endpoint for evaluating risk to various taxa. Implicit in the use of the lowest toxicity values for the most sensitive species is the presumption that these toxicity values afford protection not only for the individual surrogate species but for other untested taxa as well.

In the FIFRA risk characterization, data gaps are also considered as a source of uncertainty in the risk assessment conclusions, and each risk assessment discusses the potential for additional data to affect the risk assessment conclusions.

An additional source of uncertainty in assessing risk to aquatic life is the impacts of multiple stressors on aquatic organisms. A United States Geological Survey (USGS) 10-year study (*Gilliom et al., 2006*) shows that the most common form of pesticide exposure for aquatic organisms is simultaneous exposure to multiple pesticides. More than 50 percent of all stream samples contained five or more pesticides, although the majority of mixtures are comprised mainly of agricultural herbicides and degradates of these herbicides, or urban/residential use insecticides in urban streams. Pesticides that will be applied under the PGP may also co-occur

with other manmade contaminants and/or other pesticides from other uses. For instance, the USGS has also performed monitoring studies which revealed the widespread presence of some pharmaceuticals and personal care products in drinking water. However, although pesticides may be detected with other chemicals or in discharges covered by other NPDES permits, the majority of research and data on the effects of pesticides has focused on individual pesticides rather than on additive and synergistic toxic effects of exposure to multiple pesticides and/or non-pesticide toxicants.

Possible interactions among pesticides or between pesticides and other contaminants may occur including: independent, additive, antagonistic or synergistic. The variety of chemical interactions presented in the available literature suggests that the interaction can be a function of many factors including but not necessarily limited to: (1) the exposed species, (2) the co-contaminants in the mixture, (3) the ratio of concentrations in the mixture, (4) differences in the pattern and duration of exposure among contaminants, and (5) the differential effects of other physical/chemical characteristics of the receiving waters (e.g., organic matter present in sediment and suspended water). Quantitatively predicting the combined effects of all these variables on mixture toxicity to any given taxon with confidence is beyond the capabilities of the available data. In order to assess the impacts of environmental mixtures on aquatic life, states have included ambient toxicity testing (also called Whole Effluent Toxicity or WET testing) in their monitoring programs. WET testing allows states to identify potential impacts to aquatic life and identify the toxicant(s) and through the toxicity reduction evaluation, reduce the source(s) of the toxicant(s). The level of toxic effect to the most sensitive tested species is therefore assumed to be protective of other species that may be present in any given water body and is assumed to represent the most toxic component of a mixture. Note that a discussion of EPA's consideration of WET testing as a condition of the permit is discussed in Part III.4 of the fact sheet.

Aquatic Benchmarks

EPA's Office of Pesticide Programs (OPP) derives aquatic benchmarks by multiplying the most sensitive toxicity values (*i.e.*, the lowest acceptable toxicity value for the most sensitive species within a taxonomic group) by their respective (level of concern) LOC. These taxon-specific benchmarks, based on toxicity data used by OPP in assessments for FIFRA pesticide registration decision-making, are considered estimates of the concentrations below which pesticides are not expected to have the potential for adverse effects for the particular taxon for which those data serve as surrogates. It is reasonable to assume that above these levels, there may be potential for the pesticide to cause adverse effects to the given taxon.

EPA's Office of Water (OW) and OPP agreed that these values can be used by States and others to evaluate potential risks of pesticides in the aquatic environment, if a National Recommended Water Quality Criterion for ambient water quality is not available.[12] A number of States have used these benchmark values as indicators of whether pesticide residues detected in surface water warrant additional action such as refined monitoring efforts. While benchmarks can be useful as a screening tool, they do not provide the information necessary to link detected concentrations with their sources.

[12] Correspondence to SFIREG, November 3, 2006 from Office of Water director.

In response to recommendations and input from stakeholders, EPA developed a webpage of non-regulatory "OPP Aquatic Benchmarks."[13]

As described above, EPA's FIFRA risk assessment process includes a number of conservative assumptions that taken as a whole mitigate unreasonable ecological risk and protect water quality.

(2) Examination of national–scale ambient monitoring data to assess whether pesticide residues are currently present in waters at levels that would exceed water quality standards.

United States Geological Survey: The Quality of Our Nation's Waters – Pesticides in the Nation's Streams and Ground Water, 1992-2001.

In addition to the protective nature of the pesticide risk assessment, EPA reviewed readily available surface-water monitoring data. In 2006, the USGS National Water-Quality Assessment Program (NAWQA)[14] released a 10-year (1992-2001) study of 51 major river basins and aquifer systems that account for more than 70 percent of total United States water use and more than 50 percent of the United States drinking water supply. Most NAWQA samples were analyzed for 75 pesticides and eight degradation products, including 20 of the 25 most commonly used herbicides and 16 of the 25 most commonly used insecticides. Water samples were collected at 186 stream sites for analysis of pesticides and degradates dissolved in water. The samples were collected from streams throughout the year, including high-flow and low-flow conditions. Sampling was most intensive during the time of highest pesticide use and runoff – generally weekly or twice monthly for a 4- to 9-month period. As a general matter, the USGS uses sampling and analytic methods that provide highly reliable data. The NAWQA database stands out among available data sources in terms of the number of pesticides and sites examined, as well as the overall number of samples collected and analyzed.

Overall results. Overall, the 10-year assessment indicates that for the pesticides sampled, surface and ground water are generally not being adversely affected by pesticide applications for irrigation, drinking water, and home/recreational uses. The USGS analytical methods are very sensitive and are designed to detect and measure minute amounts – in some cases parts per trillion – that are often 10 to 100 times lower than benchmarks or water quality criteria for most pesticides. There were detections of pesticides in these samples, but the concentrations detected were generally low (parts per billion and parts per trillion). The NAWQA data generally reflect pesticides that were used in watersheds from which water samples were taken. There were also some detections of legacy pesticides that were no longer registered at the time of sampling.

For environmental effects, the USGS compared the concentrations found in the NAWQA sampling with two general types of aquatic life benchmarks (1) ambient water quality criteria (AWQC) for the pesticide and (2) benchmarks derived from the lowest acute and chronic

[13] OPP Aquatic Benchmark Table http://www.epa.gov/oppefed1/ecorisk_ders/aquatic_life_benchmark.htm

[14] Gilliom and others 2006. The Quality of Our Nation's Waters-Pesticides in the Nation's Streams and Ground Water, 1992-2001: U.S. Geological Survey Circular 1291, 172p.

ecological effects endpoint for the pesticide (OPP benchmarks). Acute AWQC and all acute OPP benchmarks were compared with each measured concentration for the most complete year of data for each NAWQA stream. Chronic AWQC were compared with 4-day moving average concentrations, chronic OPP benchmarks for invertebrates were compared to 21-day moving average concentrations, and chronic fish OPP benchmarks were compared to 60-day moving average concentrations. AWQC were available for 7 of the 83 pesticides and degradates analyzed by NAWQA. One or more OPP benchmarks were available for 60 of the 83 NAWQA analytes, including 5 of the 7 that had AWQC. A total of 62 of the pesticide compounds analyzed in water by NAWQA had one or more aquatic-life benchmarks.

A total of 20 pesticides or degradates exceeded an EPA benchmark in one or more agricultural streams and/or urban streams (see Appendix A of fact sheet for a complete list of pesticides/degradates that had exceedances). In agricultural streams, most concentrations greater than a benchmark involved chlorpyrifos, azinphos-methyl, atrazine, *p,p*'-DDE and alachlor. In urban streams most concentrations greater than a benchmark involved diazinon, chlorpyrifos, and malathion. It should be noted that pesticide concentrations in agricultural streams most often originate from terrestrial agricultural activities exempted under the CWA from NPDES permit requirements or activities not covered under this permit.

Since 2001, the last year of sampling covered by the NAWQA report, EPA has taken regulatory action under FIFRA with respect to all 20 pesticides found to be in excess of a benchmark and many of their uses have been canceled (several detections were of pesticides no longer in use prior to the start of the study). For atrazine, the registrant has been required to undertake an aggressive and innovative ecological monitoring program to protect vulnerable watersheds in areas of atrazine use, and to develop mitigation measures for watersheds that might have atrazine detections above levels of concern. Residential uses of the two pesticides most commonly detected above a benchmark (diazinon and chlorpyrifos) have been canceled. Additional detail on the nature of EPA's regulatory actions under FIFRA appears in Appendices B and C of the fact sheet.

State Water Quality Monitoring under CWA

Every two years States must identify waterbodies that are not attaining water quality standards (WQS; both narrative and numeric) under CWA Section 303(d). States must place waterbodies not meeting water quality standards on a list (303(d) list) which identifies the pollutant or pollutants causing or expected to cause the impairment. The Office of Water's Impaired Waters and Total Maximum Daily Loads website[15] (accessed November 2009) indicates 303(d) impairments in several states for 12 currently registered specific pesticides and 4 general classes of pesticides (e.g., pyrethroids; Table 1). With the adoption of a 303 list, States are required to develop a Total Maximum Daily Load (TMDL). States also must include a priority ranking for developing those TMDLs. A critical component in the TMDL process is to identify the sources of each parameter for which the waterbody is listed. Then, the State must develop waste load allocation(s) for point source(s) and load allocation(s) for nonpoint source(s).

[15] http://iaspub.epa.gov/waters10/attains_nation_cy.control?p_report_type=T

Table 1. Currently registered pesticide active ingredients listed as causes of 303(d) impairment (data accessed November 2010).

Cause of Impairment	**States**
2-Methylnaphthalene	CA, NH, WA
Atrazine	IA, IL, KS, MO, NE, OH
Azinphos-methyl	CA, OR
Carbofuran	CA
Chlorpyrifos	CA, OK, OR, WA
Dacthal	CA
Diazinon	CA, OK, WA
Endosulfan	CA, MT, WA
Malathion	CA
Methyl parathion	CA
Naphthalene	NH, WA
Phthalates	WA
Pyrethroids	CA
Tributyltin	VA
Xylenes	CA
Pesticides – listed generically	CA, HI, IN, MA, NY, OH, PA, PR, WA

According to the Office of Water's Impaired Waters and Total Maximum Daily Loads website there are a total of 71,323 causes of impairments for 303(d) listed waters[16]. Of these, approximately 2.6% (a total of 1,865) are listed as pesticides. The majority (74.3% or 1,386 of the 1,865) of impairments attributed to pesticides are for those no longer registered for use by the EPA. A total of 19.9% (372 of the 1,865) of impairments are attributed to currently registered pesticides, with an additional 5.7% (107 of the 1,865) of the impairments listed generically for pesticides, such as for "pesticides" or "organochlorine pesticides." Combined, these two categories of listings account for 0.7% (479 of 71,323) of the total causes of impairments for 303(d) listed waters nationally. However, it is important to note that many States do not routinely monitor for many currently registered pesticides which is a source of uncertainty for this assessment. Additionally, 3,401 impairments are listed for "impaired biota" and 1,317 impairments are for an "unknown" or "cause unknown – fish kills", which together account for about 6.6% of all impairments.

EPA has received ambient monitoring data for pesticides present in waters that are attributable to a variety of types of pesticide use patterns from states and other stakeholders. These data are included in the administrative record for this permit (see docket number EPA-HQ-OW-2010-0257) and in general, do not show the presence of pesticides in concentrations above levels of concern (i.e., recommended ambient water quality criteria – available at http://epa.gov/waterscience/criteria/wqctable/ or FIFRA OPP benchmark levels – available at http://www.epa.gov/oppefed1/ecorisk_ders/aquatic_life_benchmark.htm).

[16] http://iaspub.epa.gov/waters10/attains_nation_cy.control?p_report_type=T

2004 National Water Quality Inventory Report

States, tribes and territories are required to report biennially on the water quality of navigable waters in their boundaries, and the extent to which these waters support designated uses, under Section 305(b) of the Clean Water Act. In its report to Congress on the 2004 reporting cycle[17], which was submitted in January 2009, the Agency reported the results on the portion of Waters of the United States evaluated during that cycle. The report indicated that 44% of river miles assessed, 64% of lake acres assessed, and 30% of the square miles of estuaries assessed were impaired for failing to support at least one designated use.

While pesticides are not always monitored when assessing water quality, the Report to Congress indicated that pesticides were not among the most common causes of impairments in the 2004 cycle for rivers and streams, nor for lakes, ponds and reservoirs. Pesticides were the sixth leading cause of impairments for bays and estuaries, but the Report did not indicate whether these were caused by actively registered pesticides, or by sediment contamination by persistent legacy pesticides, which as described above account for the majority (74.3%) of water impairments caused by pesticides nationwide. The Report does not indicate whether any impairments identified by the States were caused by uses that will be subject to NPDES permits under the CWA.

Interpretation of Monitoring Data Relevant to the PGP

When re-evaluating the registrations of existing pesticides, the Agency considers available surface-water monitoring data as a line of evidence regarding potential aquatic risk in addition to considering exposure estimates derived from simulation models. Such monitoring data can provide a measure of trends in aquatic exposure associated with mitigation measures imposed by the Agency. For instance, the USGS's 2009 report of *Trends of Pesticide Concentrations in Corn-belt Streams* states, "(t)he declines in pesticide concentrations closely followed declines in their annual applications, indicating that reducing pesticide use is an effective and reliable strategy for reducing pesticide contamination in streams."

Monitoring studies are valuable because they may specifically target areas in which pesticides considered in the study are likely to be used. This is an effective way of evaluating impact from mitigation measures, or the increase in use of other pesticides that might replace pesticides to which mitigation measures are applied.

The best way to interpret the likely causes of pesticide detections in surface water is to consider any detection in light of the design of the monitoring study itself. For instance, the USGS's study *The Quality of Our Nation's Water – Pesticides in the Nation's Streams and Ground Water, 1992-2001*, described above, used a targeted approach, focusing on areas of relatively homogenous land-use and environmental settings to relate pesticide occurrence to individual non-point sources. The sampling was also most intensive during periods of high pesticide use and runoff. Such a design can best capture transport of pesticide to surface water

[17] http://www.epa.gov/owow/305b/2004report/

from runoff from treated agricultural fields (or treated buildings/lawns) in a watershed. But, the timing and location of sample collection may not be as effective in capturing residues of pesticides applied for purposes covered under the General Permit. Concentrations detected could at times reflect such uses, but the design of the study was meant to capture more diffuse non-point transport of pesticides in watersheds, and not point source discharge.

Uncertainties with Monitoring Data

The Agency recognizes that monitoring of pesticide levels in water has limitations in its ability to identify whether use of specific pesticides may adversely affect water quality. The product monitoring data give only a "snap shot" of the concentration in a particular waterbody at a particular time. While the USGS (*Gilliom et al., 2006*) intensified the frequency of its monitoring during times of the year when most agricultural pesticide usage commonly occurred, their sampling did not necessarily account for timing of specific pesticide applications, frequency of applications, and meteorological events that can cause pesticides to reach surface water as covered by this permit. Thus, monitoring may not collect a sample when pesticide concentrations are at peak levels or when present in the water. Moreover, if monitoring detects the presence of a pesticide, the data usually do not identify the source or if the pesticide residue is actually still a product serving its intended purpose. Ambient monitoring cannot determine whether the contamination was due to lawful use (and if so, which one) or unlawful pesticide use, an accidental spill or discharge, or whether the residues detected were from runoff, or from aquatic uses such as those to be included in the NPDES general permit. Monitoring data are often difficult to interpret because the ancillary data on pesticide usage in a basin, and factors that could make the location more or less vulnerable, are often not available.

(3) Technology-based effluent limitations in the PGP provide further protections beyond compliance with existing FIFRA requirements.

EPA expects that the technology-based effluent limitations are as stringent as necessary to meet WQS. These effluent limitations require Operators to minimize the discharge of pesticides through the use of the most efficient and effective means of Pest Management Measures, including pesticide and non-pesticide methods.

The technology-based effluent limitations require Applicators to minimize the discharge of pesticides by using only the amount of pesticide and frequency of pesticide application necessary to control the target pest, maintaining pesticide application equipment in proper operating condition, and ensuring weather conditions in the treatment area are appropriate for pesticide application.

The Applicator, to the extent not determined by the Decision-maker, must also use only the amount of pesticide and frequency of pesticide application necessary to control the target pest, using equipment and application procedures appropriate for the task.

Certain Decision-makers are also required to more fully assess and implement procedures to minimize the discharge of pesticides. In this assessment, these Decision-makers must consider human health and ecological impacts, feasibility, and cost effectiveness and include prevention, mechanical/physical methods, cultural methods, biological control agents, and as a final resort, the application of pesticides. To ensure that pesticide discharges are minimized,

these Decision-makers must identify target pest species and areas where those pests occur, identify the possible sources of the problem, and establish action thresholds or similar measures for implementing pest management strategies. The technology-based effluent limitations in Part 2.2 also require certain Decision-makers, as appropriate to analyze surveillance data prior to each pesticide application to determine when pest action thresholds are met.

The general permit includes several other provisions that the Agency expects to provide further protections beyond compliance with FIFRA requirements. For one, Part 4 of the permit requires Operators to monitor pesticide applications activities to minimize discharges and during any post-application monitoring to determine effectiveness of the pesticide application. In addition, Part 6.0 of the general permit contains requirements for all Operators to document and report adverse incidents involving non-target organisms or the environment, and to take corrective action if it is determined that revising Pest Management Measures can help to prevent future incidents. An adverse incident report calls due attention to a situation in which water quality may be impacted by pesticide use and may indicate that corrective action is required to ensure that water quality standards are further protected during future applications. The permit also requires Operators to take corrective actions to eliminate other situations such as unauthorized releases (i.e., spills or leaks) or the failure to meet applicable water quality standards. These requirements are discussed further in Part 6.0 of this fact sheet. EPA expects this approach will further reduce discharges of pesticides to Waters of the United States from the use patterns covered under this permit.

(4) Biological pesticides do not work through a toxic mode of action, or when they do, are toxic only to a very narrow range of target pest organisms. For chemical pesticides, the discharges covered under this permit are the residues after the pesticide has performed its intended purpose.

This permit provides coverage for point source discharges from certain applications of pesticides, as identified in Part 1.1.1 of the PGP. Discharges from the application of both chemical and biological pesticides are covered under this PGP consistent with the Sixth Circuit Court's reading of the CWA term "pollutant" in *National Cotton Council v. EPA.*

For chemical or conventional pesticides applied directly to waters (e.g., for aquatic weed control and aquatic nuisance pest control), it is the pesticide residue, including excess pesticide that is present outside of the treatment area or within the treatment area once the target pests have been controlled that is considered a pollutant under this permit. For any pesticide applied over water (e.g., mosquito control), any pesticide or pesticide residue that is incidentally deposited in Waters of the United States is considered a pollutant since the intended purpose of the application is to target pests above the water. Therefore, the concentrations of "pollutants" will be no higher, and in many instances significantly lower, than the product concentrations considered in EPA's assessment when registering these products.

Discharges of biological pesticides require permit coverage regardless of whether or not a residue exists. Biological pesticides or biopesticides are certain types of pesticides derived from such natural materials as animals, plants, bacteria, and certain minerals. Two classes of biopesticides are relevant to this permit, microbial pesticides and biochemical pesticides. Microbial pesticides consist of a microorganism (e.g., a bacterium, fungus, virus or protozoan) as the active ingredient. The most widely used microbial pesticides are subspecies and strains of

Bacillus thuringiensis, or Bt which do operate by a toxic mode of action yet they are toxic only to a very narrow range of target pest organisms (mosquito larvae). Biochemical pesticides, as defined at 40 CFR 158.2000(a), are naturally occurring substances that control pests by non-toxic mechanisms. Biochemical pesticides include substances, such as insect sex pheromones that interfere with mating, as well as naturally-occurring repellants and attractants.

Biopesticides are usually inherently less toxic than conventional pesticides and generally only affect the target pests and closely related organisms. Often, they are effective in very small quantities and decompose quickly thereby resulting in lower exposures and largely avoiding the pollution problems caused by chemical pesticides. When used as a component of Integrated Pest Management (IPM) programs, biopesticides can greatly decrease the use of chemical pesticides; however, use of biopesticides effectively requires users to have a very good understanding of pest management. Since biochemical pesticides, by regulatory definition, do not work through a toxic mode of action they may be less likely to result in an excursion of a water quality standard.

(5) The PGP excludes pesticide applications that result in discharges of any pesticide to (1) waters impaired for that pesticide or (2) any Tier 3 waters (i.e., outstanding national resource waters) except for applications made to restore or maintain water quality or to protect public health or the environment that either do not degrade water quality or only degrade water quality on a short-term or temporary basis.

EPA identified two scenarios where it believes the PGP may not be adequately protective of water quality standards and has excluded those discharges from coverage under this permit. Namely, the PGP excludes from coverage: (1) any discharges from a pesticide application to Waters of the United States if the water is identified as impaired by a substance which either is an active ingredient in that pesticide or is a degradate of such an active ingredient and (2) discharges to Tier 3 Waters (i.e., Outstanding National Resource Waters) except for pesticide applications made to restore or maintain water quality or to protect public health or the environment that either do not degrade water quality or only degrade water quality on a short-term or temporary basis. Any Operator desiring to discharge in either of these two scenarios is required to submit an application for an NPDES individual permit. Links to lists of impaired waters and Tier 3 waters is available at www.epa.gov/npdes/pesticides. Additional discussion of the basis for these requirements is provided in Part III.1.1.2 of the fact sheet.

4. Site Monitoring

Monitoring is required in any NPDES permit to demonstrate compliance with the permit conditions. Monitoring requirements apply from the time any authorized Operator begins discharging under this permit. These requirements are not tied to submission of an NOI. There are a variety of monitoring methods that a “traditional” NPDES permit may require, including end-of-pipe monitoring to show compliance with relevant water quality-based and technology-based effluent limitations prior to discharging to a receiving waterbody. Monitoring may also pertain to actions taken to ensure that record keeping or other permit control activities are being properly implemented. Water quality monitoring of receiving streams is not typically required in NPDES permits unless it is required to determine among other things, compliance with mixing zone dilution standards or some other special permit condition.

Pursuant to CWA sections 308 and 402(a)(2), 40 CFR 122.43(a), and other applicable implementing regulations, the following requirements have been included in the permit, as discussed below. The monitoring requirements of this permit are narrative and demonstrate compliance with permit conditions by using currently established pesticide use routines for monitoring pest control. For instance, the permit requires routine visual inspections (described below) to be conducted as part of the pest control activity and/or as part of post-application pest surveillance, and calls for records of the pesticide discharge volume to be kept. The monitoring requirements of the permit are reasonable measures of good pest management practice that the conscientious Operator should be currently employing to ensure environmental health and safety and optimal control of pest organisms.

In addition, EPA will collect information required from permittees. EPA will also solicit and collect information and water quality monitoring and other data from states, federal agencies, and other entities on water quality to help determine the presence of pesticides, degradates, metabolites, etc. EPA will encourage states, federal agencies, and other entities to collect this information. The Agency will compile and analyze this information and data and has agreed to meet with NMFS annually during the permit term to present and discuss the results and identify data gaps and possible approaches to address the gaps.

Monitoring of pesticide discharges poses several challenges not generally encountered in "traditional" NPDES permitting situations. For example, there is no "wastewater discharge" per se from pesticide applications that is analogous to end-of-pipe discharges. For example, a manufacturing plant would typically direct its wastewater through a treatment system to remove pollutants, and then would direct the effluent through a pipe into a receiving waterbody. However, for chemical pesticide applications, at the time of application the pesticide contains both the portion serving its intended purpose as well as the potential residual for which monitoring data would be appropriate. Thus, monitoring the "outfall" in this case would merely provide data on the amount of the product as applied (information already known through the FIFRA registration process) and would be inappropriate to compare with any type of technology based effluent limitation or water quality standard.

EPA considered requiring ambient water quality monitoring. However EPA determined that it was infeasible for the following reasons:

1) Uncertainty: Ambient water quality monitoring would generally not be able to distinguish whether the results were from the pesticide application for which monitoring is being performed, or some other upstream source.

2) Lack of applicable measurable standards: Federal pesticide-specific ambient water quality criteria do not exist at this time for the vast majority of constituents in the products authorized for use under this PGP.

3) Safety and Accessibility: Pesticides, particularly those used for mosquito control and forestry pest control, are often applied over waterbodies in remote areas, hazardous terrain, and swamps that are either inaccessible or pose safety risks for the collection of samples.

4) Difficulty of residue sampling for chemical pesticides: For chemical pesticides, the "pollutant" regulated by the PGP is the residue that remains after the pesticide has completed its

activity, and it is this residue that would be the subject of any water quality monitoring requirement. However, the point at which only "residue" remains is not practically discernable at this time for all pesticides.

5) Usefulness of data: Some states have questioned the value of ambient water quality monitoring data obtained from state permitting programs. The data generally showed that water quality impacts were not occurring, and one state even discontinued the requirement in revisions of its state permit.

Given the infeasibility of requiring ambient water quality data to demonstrate permit compliance, EPA has determined that there are suitable alternative monitoring activities to determine permit compliance, other than ambient water quality monitoring, for this permit.

Additionally, in assessing the appropriateness of requiring ambient water quality monitoring, EPA also considered Whole Effluent Toxicity (WET) testing as a possible option for assessing Operator compliance with permit conditions; however, WET testing in an NPDES permit program is best used to monitor whether an Operator's discharge is toxic and not whether a receiving stream (i.e., the ambient environment), that may be influenced by a number of different discharges from different Operators and different sources, is toxic. In addition, WET testing would not indicate the actual source of the toxicity. If a waterbody is found to be toxic or to contain pollutants above water quality standards, it can be quite complex to identify the source of the toxicity, which may or may not actually be the NPDES permittee performing the monitoring.

Thus, the monitoring program that EPA has developed for this PGP has been tailored to accommodate the unique situations related to pesticide applications. Routine visual monitoring is required in the PGP and can be used to determine if any pesticide use practices may need to be revised to ensure that avoidable adverse impacts to the environment do not occur (See Section 4.2 of fact sheet). Monitoring records required by those Operators who submit NOIs will establish a history that may indicate if or when practices need to be reconsidered.

4.1 Visual Monitoring Requirements for Pesticide Applicators

Visual monitoring assessments are required as a means of identifying, for example, instances of detrimental impact to non-target organisms, disruption or degradation of wildlife habitat, or the prevention of designated recreational or municipal uses of a waterbody that may possibly be related to the Operator's use of pesticides in a given area. This requirement consists of visually monitoring the area to and around where pesticides are applied for possible and observable adverse incidents, such as unanticipated death or distress of non-target organisms and disruption of wildlife habitat, recreational or municipal water use.

Visual monitoring assessments are required during the pesticide application when feasibility and safety allow. Visual monitoring is not required during the course of pesticide application when that application is performed in darkness as it would be infeasible for the inspector to note adverse effects under these circumstances. Additionally, the following scenarios often preclude visual monitoring during pesticide application:

1. Applications made from an aircraft

2. Applications made from a moving road vehicle when the Applicator is the driver
3. Applications made from moving watercraft when the Applicator is the driver
4. Applications made from a moving off-road wheeled or tracked vehicle when the Applicator is the driver.

4.2 Visual Monitoring Requirements for all Operators

Visual monitoring must also be conducted during any post-application surveillance, such as to determine the efficacy of the pesticide application. Visual monitoring of this type is required of all Operators but only if the Operator, be it the Applicator or the Decision-maker or both, performs post application surveillance in the course of business. EPA expects that post-application visual assessments are reasonably conducted on foot or from a stationary vehicle, although they might also be conducted from a moving vehicle, including a boat or plane, in certain circumstances.

5. Pesticide Discharge Management Plan (PDMP)

Any Decision-maker who is or will be required to submit an NOI and is not a small entity[18] must develop a PDMP, except for any pesticide applications made in response to a Declared Pest Emergency situation, as defined in Appendix A of the permit or any Decision-maker who is or will be required to submit an NOI ***solely*** because of discharges to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit. EPA defines a Decision-maker that is not a small entity as a *large entity* in the permit. Large entity Decision-makers must prepare the PDMP by the time the NOI is filed.

Any Decision-maker who is or will be required to submit an NOI and is a small entity (i.e., is below the SBA size standard as, as defined at 13 CFR. 121.201, or is a public entity serving a population of 10,000 or less), is not required to develop a PDMP. Small entity Decision-makers are required to document activities as described in Part III.7 of this fact sheet. EPA recognizes that SBA defines "small entities" as including government entities that serve populations of less than 50,000 persons. However, EPA's NPDES program has historically considered "major" municipal NPDES permits as those that serve greater than 10,000 persons (i.e., with a wastewater treatment plant design of greater than one million gallons a day). Major NPDES permittees have increased recordkeeping and public notice obligations over minor NPDES which is consistent with EPA's intent for the PGP to impose additional recordkeeping and reporting information only on these larger communities.

The PDMP itself does not contain effluent limitations; rather it constitutes a tool both to assist the Decision-maker in documenting what pest management measures it is implementing to meet the effluent limitations, and to assist the permitting/compliance authority in determining whether the effluent limitations are being met. Developing a PDMP helps Decision-makers ensure they have (1) taken steps to identify the pest problem, (2) evaluated pest management options, and (3) selected appropriate pest management measures to control pesticide discharges. A PDMP is a "living" document that requires reviews and must be kept up-to-date. Where pest

[18] A small entity is any (1) private enterprise that does not exceed the Small Business Administration size standard as identified at 13 CFR 121.201, or (2) local government that serves a population of 10,000 or less.

management measures are modified or replaced to meet effluent limitations, such as in response to a Part 6.1 triggering condition, such changes must be documented in the PDMP. All changes to the PDMP must be made before the next pesticide application that results in a discharge, if practicable, or if not, no later than 90 days after any change in pesticide application activities. Failure of a Decision-maker to develop and maintain an up-to-date PDMP is a violation of the permit. This recordkeeping violation is separate and distinct from a violation of any of the other substantive requirements in the permit (e.g., effluent limitations, corrective action, monitoring, reporting, and state-specific requirements).

A PDMP must include identification of the pesticide discharge management team, a description of the pest problem, and a description of the pest management options evaluation. Decision-makers must also provide response procedures for spill response and adverse incident response. The size of a pest management area is determined by the Decision-maker responsible for and with the authority to conduct pest management activities. For example, the pest management area for a mosquito control district is the total area of the district. Once the plan is developed, the Decision-maker must maintain the plan thereafter for the duration of coverage under this general permit. For any Decision-maker for which the annual treatment area threshold triggers the NOI requirement (and the Decision-maker is a large entity), the Decision-maker must keep the plan up-to-date for the duration of permit coverage even if the annual treatment area subsequently falls below the annual treatment area threshold.

Decision-makers may choose to reference other documents, such as a pre-existing pest management plan or spill prevention and response plan, in the PDMP rather than recreating the same text in the PDMP. It is not required that a Decision-maker must have authored the pre-existing plan in order to use it. When referencing other documents, the Decision-maker is responsible for ensuring his/her PDMP and the other documents together contain all the necessary elements for a complete PDMP, as specified in Part 5.1. In addition, the Decision-maker must ensure that a copy of relevant portions of those referenced documents is attached to the PDMP and is located on-site and it is available for review consistent with Part 5.3 of the permit.

5.1. Contents of Your PDMP

The PDMP prepared under this permit must meet specific requirements under Part 5.1 of the permit. Generally, Decision-makers must document the following: (1) a pesticide discharge management team; (2) a description of the pest management area and the pest problem; (3) a description of pest management options evaluation; (4) response procedures for spill response and adverse incident response; and (5) any eligibility considerations under other federal laws.

Pesticide Discharge Management Team

The permit requires that a qualified individual or team of individuals be identified to manage pesticide discharges covered under the permit. Identification of a pesticide discharge management team ensures that appropriate persons (or positions) are identified as necessary for developing and implementing the plan. Inclusion of the team in the plan provides notice to staff and management (i.e., those responsible for signing and certifying the plan) of the responsibilities of certain key staff for following through on compliance with the permit's conditions and limits.

The pesticide discharge management team is responsible for developing and revising the PDMP, implementing and maintaining the Pest Management Measures to meet effluent limitations, and taking corrective action where necessary. Team members should be chosen for their expertise in the relevant areas to ensure that all aspects of pest management are considered in developing the plan. The PDMP must clearly describe the responsibilities of each team member to ensure that each aspect of the PDMP is addressed. EPA expects most Decision-makers will have more than one individual on the team, except for those with relatively simple plans and/or staff limitations. The permit requires that team members have ready access to any applicable portions of the PDMP and the permit.

Problem Identification

This section includes the pest problem description, action threshold(s), a general location map, and water quality standards.

1. Pest Problem Description.

The permit requires that the PDMP include a description of the pest problem at the pest management area. A detailed pest management area description assists Decision-makers in subsequent efforts to identify and set priorities for the evaluation and selection of Pest Management Measures taken to meet effluent limitations set forth in Parts 2 and 3 and in identifying necessary changes in pest management. The description must include identification of the target pest(s), source of the pest problem, and source of data used to identify the problem. The permit allows use of historical data or other available data (e.g., from another similar site) to identify the problem at your site. If you use other site data, you must document in this section why data from your site is not available or not taken within the past year and explain why the data is relevant to your site. Additionally, the pest management area descriptions should include any sensitive resources in the area, such as unique habitat areas, rare or listed species, or other species of concern that may limit pest management options.

2. Action Threshold(s)

The permit requires that the PDMP include a description of the action threshold(s) established for the target pest, including a description of how they were determined and method(s) to determine when the action threshold(s) has been met. An action threshold is a level of pest prevalence (or other indicator) at which an Operator takes action to reduce the pest population.

3. General Location Map

The PDMP must also contain a general location map of the site that identifies the geographic boundaries of the area to which the plan applies and location of the Waters of the United States. To improve readability of the map, some detailed information may be kept as an attachment to the site map and pictures may be included as deemed appropriate.

4. Water Quality Standards

Operators must identify any Tier 3 (Outstanding National Resource Waters and any water(s) impaired for a specific pesticide or its degradates to which there may be a discharge. Internet links to all state, territory and tribal water quality standards are available at: http://epa.gov/waterscience/standards/wqslibrary/.

Description of Pest Management Measures Options Evaluation

The permit requires that the PDMP include a description of the Pest Management Measures implemented to meet the applicable technology-based or water quality-based effluent limitations. The description must include a brief explanation of the Pest Management Measures used at the site to reduce pesticide discharge, including evaluation and implementation of the six management options (no action, prevention, mechanical/physical methods, cultural methods, biological control agents, and pesticides). Decision-makers must consider impact to non-target organisms, impact to water quality, feasibility, and cost effectiveness when evaluating and selecting the most efficient and effective means of Pest Management Measures to minimize pesticide discharge to Waters of the United States.

All six management options may not be available for a specific use category and/or treatment area. However, the PDMP must include documentation of how the six management options, including combination of these options, were evaluated prior to selecting a site specific Pest Management Measures. For the no action option, Operators should document the impact of this option without any current Pest Management Measures at the site. For the prevention management option, the Decision-maker should document the methods implemented to prevent new introductions or the spread of the pests to new sites such as identifying routes of invasion and how these can be intercepted to reduce the chance of invasion. Prevention may include source reduction, using pathogen-free or weed-free seeds or fill; exclusion methods (e.g., barriers) and/or sanitation methods, like wash stations, to prevent reintroduction by vehicles, personnel, etc. Some prevention management methods may fall under mechanical/physical or cultural methods as well.

For the pesticide management option, Decision-makers should include a list of active ingredient(s) evaluated. Discussion should also identify specific equipment or methods that will prevent or reduce the risks to non-target organisms and pesticide discharges to Waters of the United States.

Response Procedures

The following procedures necessary to minimize discharges must be documented in the PDMP

1. Spill Response Procedures

The PDMP must document procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other release. In addition, the PDMP must include documentation of the procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies.

2. Adverse Incident Response Procedures

In the PDMP, Decision-makers must document appropriate procedures for responding to an adverse incident resulting from pesticide applications. Decision-makers must identify and document the following:

- Procedures for responding to any adverse incident resulting from pesticide applications;
- Procedures for notification of the adverse incident, both internal to the Decision-maker's agency/organization and external.;
- State/Federal permitting agency contacts with phone numbers;
- Name, location, and telephone of nearest emergency medical facility;
- Name, location, and telephone of nearest hazardous chemical responder; and (including police and fire department).

Documentation to Support Eligibility Considerations under other Federal Laws [reserved]

Signature Requirements

The PDMP must be signed and certified in accordance with the signatory requirements in the Standard Permit Conditions part of the permit (Appendix B, subsection B.11). This requirement is consistent with standard NPDES permit conditions described in 40 CFR 122.22 and is intended to ensure that the Decision-maker understands his/her responsibility to create and maintain a complete and accurate PDMP. The signature requirement includes an acknowledgment that there are significant penalties for submitting false information.

5.2 Pesticide Discharge Management Plan Modifications.

This permit requires that the PDMP be updated whenever any of the triggering conditions for corrective action in Part 6.1 of the permit occur, or when a review following the triggering conditions in Part 6.1 requires the Operator to revise his/her Pest Management Measures as necessary to meet the effluent limitations in this permit (Part 2). Keeping the PDMP up-to-date will help the Decision-maker ensure that the condition that triggered the corrective action does not reoccur. All changes to the PDMP must be made before the next pesticide application that results in a discharge, if practicable, or if not, no later than 90 days after any change in pesticide application activities or after an annual review.

It is important to note that failure to update the PDMP in accordance with Part 5.2 is a recordkeeping violation, not a violation of an effluent limit. For example, if the Decision-maker changes its spill response procedures, but fails to update its PDMP to reflect these changes, a recordkeeping violation will result. The Decision-maker must revise its PDMP to reflect the new procedures and include documentation of the corrective action (in accordance with Part 6) to return to full compliance.

5.3 Pesticide Discharge Management Plan Availability.

This permit requires that a copy of the current PDMP, along with all supporting maps and documents, be kept at the address provided on the NOI. The PDMP and all supporting documents must be immediately available to representatives of EPA, a State, Tribal, or local agency governing pesticide applications, as well as representatives of the United States Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) at the time of an on-site inspection or upon request. This requirement is consistent with standard NPDES permit conditions described in 40 CFR 122.41. Part 5.3 of this permit indicates that EPA may provide access to portions of your PDMP to a member of the public upon request. Confidential Business Information (CBI) may be withheld from the public, but consistent with 40 CFR Part 2, may not be withheld from EPA or the Services.

6.0 Corrective Action

The purpose of including corrective action requirements in this permit is to assist this new universe of NPDES permittees with effectively meeting technology-based and water-quality-based effluent limitations and implementing Pest Management Measures in this permit. Corrective action requirements apply from the time any authorized Operator begins discharging under this permit. These requirements are not tied to submission of an NOI. Corrective actions in this permit are follow-up actions an Operator must take to assess and correct problems. They require review and revision of Pest Management Measures and pesticide application activities, as necessary, to ensure that these problems are eliminated and will not be repeated in the future. The permit makes clear that the Operator is expected to assess why a specific problem has occurred and document what steps were taken to eliminate the problem. EPA believes this approach will help Operators in complying with the requirements of the permit on a consistent basis. Compliance issues with some of the permit's requirements -- for instance, those related to reporting and recordkeeping and some of those related to operation and maintenance -- may be able to be corrected immediately simply by following already established procedures, and therefore, are not considered problems that trigger the corrective action provisions of the permit.

It should be noted that a situation triggering corrective action is not necessarily a permit violation and, as such, may not necessarily trigger a modification of Pest Management Measures to meet effluent limitations. However, failure to conduct (and document) corrective action reviews in such cases does constitute a permit violation.

6.1 Situations Requiring Revision of Pest Management Measures

Operators are required to review and, as necessary, revise the selection and implementation of their Pest Management Measures to eliminate any of the following situations:

- An unauthorized release or discharge associated with the application of pesticides (e.g., spill, leak, or discharge not authorized by this or another NPDES permit) occurs;
- Operators become aware, or EPA concludes, that Pest Management Measures are not adequate/sufficient for the discharge to meet applicable water quality standards;
- Any monitoring activities indicate failure to meet applicable technology-based effluent limitations in Part 2;
- An inspection or evaluation by an EPA official, or local, state, or Tribal entity, determines that modifications are necessary to meet the non-numeric effluent limitations detailed in Part 2 of the PGP; or

- An Operator observes or is otherwise made aware (e.g., a third party notification) of an adverse incident.

EPA considers the above situations to be of significant concern. Thus, EPA is requiring Operators to assess the cause of these situations which may be affiliated with the Operator's discharge from the application of pesticides and to take any necessary steps to eliminate the situation and ensure that the situation will not be repeated in the future.

The purpose of Part 6.1 is to ensure compliance with corrective action requirements through increased accountability and oversight. EPA views ongoing assessment of the effectiveness of Pest Management Measures and corrective actions as integral to an effective pesticide management program. Written records associated with corrective action assessments must be kept with the other recordkeeping documentation required by this permit.

6.2. Corrective Action Deadlines

The permit requires that corrective action be completed "before or, if not practicable, as soon as possible after the next pesticide application that results in a discharge." EPA emphasizes that this timeframe is not a grace period within which an Operator is relieved of any liability for a permit violation. EPA is adopting this flexible deadline to account for the variation in types of responses (e.g., evaluate situation and select, design, install, and implement new or modified Pest Management Measures) that may be necessary to address any identified situations of concern. EPA recognizes that in rare cases a corrective action review may identify the need for substantial improvements to the Operator's Pest Management Measures, and does not want to limit the selection and implementation of such controls with an inflexible deadline. Another possibility is that EPA or the Operator may determine that further monitoring is needed under Part 6.3 of the permit to pinpoint the source of the problem, and this monitoring may need to be conducted during future pesticide application activities. However, EPA believes that in the vast majority of cases, corrective action reviews will identify responses that can be taken quickly, either before the next pesticide application that results in a discharge or shortly thereafter.

6.3 Effect of Corrective Action

The occurrence of a situation described in Part 6.1 may, but does not necessarily, constitute a violation of the permit. The occurrence of a situation identified in Part 6.1 does require the Operator to immediately review and as necessary, revise the selection and implementation of their Pest Management Measures to eliminate the situation. Part 6.3 explains that taking corrective action does not absolve the Operator of any liability for a permit violation requiring that action, however, failure to take required corrective action will constitute an original or an additional permit violation. EPA will consider the appropriateness and promptness of corrective action in determining enforcement responses to permit violations. EPA may impose additional requirements and schedules of compliance, including requirements to submit additional information concerning the condition(s) triggering corrective action, additional site-specific water-quality based limitations, additional monitoring requirements, or other schedules and requirements more stringent than specified in this permit. Those requirements and schedules will supersede those of Parts 6.1 and 6.2 if such requirements conflict.

6.4 Adverse Incident Documentation and Reporting

Part 6.4 of the PGP requires Operators to take specific actions in response to identified adverse incidents which may have resulted from a discharge from the Operator's pesticide application. Namely, Operators are required to provide oral notice to EPA within 24 hours and then follow-up with a written report within 30 days of becoming aware of the adverse incident. EPA defines an "adverse incident" in Appendix A of the permit, but generally it is defined as any effect of a pesticide's use that is unexpected or unintended in which there is evidence that a person or non-target organism has likely been exposed to a pesticide residue and suffered a toxic or adverse effect.

Part 6.4.1 requires Operators to call the appropriate EPA Incident Reporting Contact within 24 hours of any identified adverse incident and provide basic information about it. The purpose of this requirement is twofold: (1) to provide an opportunity for the Agency to respond to these incidents as soon as reasonably can be expected, and (2) to provide a basis for potential corrective actions. EPA does not expect this initial notification to be detailed but merely a reporting of the date of the finding, a general discussion of the incident and a review of the necessity to conduct corrective action. The permit requires Operators to document the information identified in 6.4.1, including the date and time that EPA was notified and a description of any deviations from 6.4.1 notification requirements based on nuances of the adverse incident. For example, an Operator may decide to notify multiple EPA contacts because of the severity of the adverse incident. This type of information should be included in the written documentation of the 24-hour notification as described below.

Part 6.4.2 requires Operators to provide a written report of the adverse incident to the appropriate EPA Regional office and to the State Lead Agency for pesticide regulation within 30 days of discovering the adverse incident. The adverse incident report must include the following information:

- Information required to be provided in Part 6.4.1.1;
- Date and time you contacted EPA notifying the Agency of the adverse incident;
- Location of incident, including the names of any waters affected and appearance of those waters (sheen, color, clarity, etc.);
- A description of the circumstances of the incident including species affected, number of individual and approximate size of dead or distressed organisms;
- Magnitude of the effect (e.g., aquatic square area or total stream distance affected);
- Quantity of pesticide applied and EPA registration number of pesticide product, intended use site (e.g., banks, above, or direct to water), and method of application;
- Description of the habitat and the circumstances under which the incident occurred (including any available ambient water data for pesticides applied);
- Information on any laboratory tests performed and test results; and
- Actions to be taken to prevent recurrence of the incident.

EPA believes adverse incident information associated with discharges from the application of pesticides is useful to the Agency because the information:

- Provides the Agency with an indication of the effectiveness of the permit in controlling discharges to protect water quality, including data upon which the Agency may base future permit decisions (e.g., modifications to or reissuance of this permit).
- May be considered when reviewing applications for registration of new pesticides that are chemically similar to existing pesticides, as well as re-evaluations of existing pesticides;
- May be considered in ecological risk assessment and during deliberations on risk management decisions;
- May be reviewed to determine trends that may indicate potential ecological impacts with an existing pesticide and/or to track improvements when mitigation measures are applied;
- Provides information on the nature, extent, and severity of incidents to decision-makers, stakeholders, and the public; and
- Provides the Agency with information on which to assess compliance with regulatory requirements, including documentation and reporting.

Currently, there is no database that includes adverse reporting from anyone other than the registrant under 6(a)(2) of FIFRA. EPA does not consider inclusion of adverse incident reporting in the NPDES permit to be a duplicative requirement to the FIFRA section 6(a)(2) requirements for registrant reporting of adverse incidents. This is because pesticide registrants are not likely to be directly covered under the PGP. Requiring the reporting of adverse incidents and follow-up corrective actions may address the lack of a universal, mandatory legal duty for pesticide users to report adverse incidents, at least for the pesticide use patterns covered by this permit.

EPA acknowledges that assessing and correcting adverse incidents may be complicated in certain instances. For example, symptoms associated with adverse incidents are often vague or mimic other causes which may lead to incorrect diagnoses. Thus, it may be difficult to identify and track chronic effects resulting from pesticides discharges. It may also be difficult to observe adverse effects because of limited visibility or access such as dead fish poisoned in a wetland under dense vegetation or in sparsely populated areas or because scavengers scatter or devour carcasses before discovery. However, EPA believes that it is important to identify to the extent feasible situations where adverse effects occur where discharges from the application of pesticides also occur.

Immediately observable signs of distress or damage to non-target plants, animals and other macro-organisms within the treatment area may warrant concern for a possible adverse incident related to a discharge of pesticides during application. EPA acknowledges that some degree of detrimental impact to non-target species may occur and may be acceptable during the course of normal pesticide application. EPA expects Operators to use their best professional judgment in determining the extent to which non-target effects appear to be abnormal or indicative of an unforeseen problem associated with an application of pesticides.

During a visual inspection, Operators should watch for distressed or dead juvenile and small fish, washed up or floating fish, fish swimming abnormally or erratically, fish lying

lethargically at the water surface or in shallow water, fish that are listless or nonresponsive to disturbance, the stunting, wilting, or desiccation of non-target submerged or emergent aquatic plants, and other dead or visibly distressed non-target organisms including amphibians, turtles, and macro-invertebrates. These observations must be noted unless they are deemed not to be aberrant (for example, distressed non-target fish are to be expected when conducting pest control with rotenone and non-target vegetation will be stressed near the target of contact herbicides). It should be noted that observation of these impacts does not necessarily imply that a pesticide has been misused or that there has been a permit violation or an instance of noncompliance, but may provide cause for further investigation of local water quality or reconsideration of Pest Management Measures.

Complete information concerning adverse impacts will aid EPA in any review of current or future pesticide use, adherence to Pest Management Measures, or effectiveness of these measures. Reporting of adverse incidents is not required under this permit in the following situations: (1) you are aware of facts that indicate that the adverse incident was not related to toxic effects or exposure from the pesticide application; (2) you have been notified in writing by EPA that the reporting requirement has been waived for this incident or category of incidents; (3) you receive information notifying you of an adverse incident but that information is clearly erroneous; (4) an adverse incident occurs to pests that are similar in kind to pests identified as potential targets on the FIFRA label. However, even for these situations, certain records must be kept on site by those Decision-makers who are required to submit NOIs, pursuant to Part 7.3 and 7.4 of the permit.

6.5 Reportable Spills and Leaks

Part 6.5.1 requires Operators to call the appropriate EPA Incident Reporting Contact to report any spill or leak of a hazardous substance or oil into Waters of the United States with 24 hours of becoming aware of the spill or leak.[19] Part 6.5.2 requires Operators to document this notification within 30 days of becoming aware of such spill or leak. If the spill or leak triggers the notification in Part 6.5.1 and results in an adverse incident, then Operators must report the incident per the guidelines in Part 6.4.1 and 6.4.2. If the spill or leak triggers the notification in Part 6.5.1, but does not result in an adverse incident, then Operators must document and retain information outlined in Part 6.5.2 within 30 days of becoming aware of the situation. This documentation provides a written record of what you reported to EPA orally. It should also include a description of the reporting system that will be used to alert responsible managers and legal authorities in the event of a future spill or leak and a description of preventive measures to prevent, contain, or treat spills and leaks of these materials. Part 6.4.3 requires Operators to notify either the National Marine Fisheries Service or the United States Fish and Wildlife Service if the Operator becomes aware of an incident that may have resulted from a discharge from your pesticide application that adversely affects a federally-listed threatened or endangered species or its federally-designated critical habitat. This information will be used by EPA to ascertain compliance with permit conditions.

[19] Reportable Spills and Leaks are defined as those that trigger the requirement to notify the National Response Center (40 CFR Parts 110, 117, 302) based on the type of pollutant and quantity released.

6.6 Documentation for Other Corrective Action

For any event described in Part 6.1 of the permit, other than for adverse incidents or reportable spills or leaks, immediate reporting to EPA is not required, but Operators must document basic information describing the event and the Operators' response to that event within 30 days. For triggering events in Part 6.1, where the Operator determines that any revision to Pest Management Measures is not necessary, the Operator must still document the review and the basis for this determination. EPA is not requiring Operators to submit this documentation to the Agency. Rather, EPA expects Operators to retain this information on-site and upon request, to make any such records available to EPA or any other Federal, state, or local regulatory agency governing pesticide applications. A summary of this information must also be included in the annual report for Operators subject to the annual reporting requirement.

7. Recordkeeping and Annual Reporting

This permit requires all Decision-makers and Applicators to maintain certain records to help them assess performance of Pest Management Measures and to document compliance with permit conditions. Recordkeeping and reporting requirements apply from the time any authorized Operator begins discharging under this permit. These requirements are consistent with Federal regulations at 40 CFR 122.41(j), but have been tailored to more closely reflect the requirements in the PGP. This permit requires a basic set of records to be maintained by all Decision-makers and Applicators, as well as separate requirements depending on the type of Operator (i.e., Applicator, For-Hire Applicators, NOI submitting Decision-maker that is a small entity and NOI submitting Decision-maker that is a large entity). Part 7 of the permit sets forth the recordkeeping requirements for each of these types of Operators. Operators can rely on records and documents developed for other programs, such as requirements under FIFRA, provided all requirements of the permit are satisfied.

EPA has found that it is appropriate and reasonable to require different records for different types of Operators, reasoning that the recordkeeping responsibilities assigned in the permit reflect the nature of involvement in pesticide application activities for the Operators described. The following sections describe the sets of records that the permit requires different types of Operators keep, and enumerates the specific information items to be recorded.

7.1 Records to be kept by all Operators (all Decision-makers and all Applicators)

These records must be kept by *all* Operators, including those not submitting an NOI. Although this section is a universal requirement, these particular records are necessary only in the event of an adverse incident, the case that corrective action was required, or in the event of a discharge resulting from a spill or leak.

a. A copy of any Adverse Incident Reports (See Part 6.4.2);

b. Rationale for any determination that reporting of an identified adverse incident is not required, consistent with allowances identified in Part 6.4.1.2;

c. A copy of any corrective action documentation (See Part 6.6); and,

d. A copy of any spill and leak or other unpermitted discharge documentation (See Part. 6.5.2)

7.2 Records to be kept by all For-Hire Applicators

All Operators who are For-Hire Applicators, as defined in Appendix A of the permit, must keep the records listed above, as well as records that specifically document pesticide application equipment maintenance and details of the pesticide application event. Since Decision-makers who are not themselves performing pesticide applications are generally not able to record such information, EPA requires different recordkeeping requirements depending on the type of Operator.

a. Documentation of equipment calibration; and

b. Information on each treatment area to which pesticides are discharged, including:

1. Description of each treatment area, including location and size (acres or linear feet) of treatment area and identification of any waters, either by name or by location, to which pesticide(s) are discharged;
2. Pesticide use pattern(s) (i.e., mosquito and other flying insects, weed and algae, animal pest, or forest canopy);
3. Target pest(s);
4. Documentation of any assessment of weather conditions in the treatment area prior to and during application to ensure application is consistent with all applicable federal requirements;
5. Name of each pesticide product used including the EPA registration number;
6. Quantity of each pesticide product applied to each treatment area;
7. Pesticide application date(s); and
8. Whether or not visual monitoring was conducted during pesticide application and/or post-application and if not, why not and whether any unusual or unexpected effects identified to non-target organisms.

7.3 Records to be kept by Small Entities, Submitting an NOI

As mentioned in Part 5, any Decision-maker that is required to submit an NOI and is below the SBA thresholds for small businesses or is a public entity serving a population of fewer than 10,000, is defined as a *small entity* in the permit. Beginning January 12, 2012, small entities are required to keep a basic records set, outlined in Part 7.3 of the permit, all of which can be recorded on the Pesticide Discharge Evaluation Worksheet provided in PGP Appendix F.

Decision-makers who are required to submit an NOI and who are defined as small entities (as identified in Part 5) are required to keep the following records at the address provided on the NOI, as identified in Part 1.2.2. A worksheet for documenting this information on each treatment area is provided in Appendix F, Pesticide Discharge Evaluation Worksheet.

a. Copy of the NOI submitted to EPA, any correspondence exchanged between the Decision-maker and EPA specific to coverage under this permit, and a copy of the EPA acknowledgment letter with the assigned permit tracking number;

b. Documentation of equipment calibration (only if Decision-maker is also the Applicator);

c. Information on each treatment area to which pesticides are discharged, including:

1. Description of treatment area, including location and size (acres or linear feet) of treatment area and identification of any Waters of the United States, either by name or by location, to which pesticide(s) are discharged;
2. Pesticide use pattern(s) (i.e., mosquito and other flying insects, weed and algae, animal pest, or forest canopy);
3. Target pest(s) and explanation of need for pest control;
4. Description of pest management measure(s) implemented prior to the first pesticide application;
5. Company name and contact information for pesticide applicator;
6. Name of each pesticide product used including the EPA registration number;
7. Quantity of each pesticide product applied to each treatment area;
8. Pesticide Application Start Date;
9. Pesticide Application End Date; and
10. Whether or not visual monitoring was conducted during pesticide application and/or post-application and if not, why not and whether any unusual or unexpected effects identified to non-target organisms.

7.4 Records to be kept by Large Entities, Submitting an NOI

Any Decision-maker that is required to submit an NOI and is above the Small Business Administration (SBA) threshold for a small business or a public entity that serves a population of 10,000 or more is defined as a *large entity* in the permit. Beginning January 12, 2012, large entities are required to keep the records listed in Part 7.4 of the permit. EPA expects that large entities will have a greater capability than small entities to record specific details of the pest treatment area, and is therefore requiring slightly more comprehensive recordkeeping. In addition, much of the records set for large entities are reflected in the annual report that these entities must submit. The reported information will allow EPA to better characterize the discharges resulting from pesticide applications in a variety of different circumstances.

Decision-makers who are to submit an NOI and are defined as large entities (as identified in Part 5) must keep the following records as identified in Section 7.4 of the permit.

a. Copy of the NOI submitted to EPA, any correspondence exchanged between the Decision-maker and EPA specific to coverage under this permit, and a copy of the EPA acknowledgment letter with the assigned permit tracking number;

b. A copy of the PDMP, including any modifications made to the PDMP during the term of this permit;

c. Copy of annual reports submitted to EPA;

d. Documentation of equipment calibration (only if Decision-maker is also the Applicator);

e. Information on each treatment area to which pesticides are discharged, including:

1. Description of each treatment area, including location and size (acres or linear feet) of treatment area and identification of any Waters of the United States, either by name or by location, to which pesticide(s) are discharged;
2. Pesticide use pattern(s) (i.e., mosquito and other flying insects, weed and algae, animal pest, or forest canopy);
3. Target pest(s) and explanation of need for pest control;
4. Action Thresholds;
5. Method and/or data used to determine that action threshold(s) has been met;
6. Description of pest management measure(s) implemented prior to the first pesticide application;
7. Company name and contact information for pesticide applicator;
8. Name of each pesticide product used including the EPA registration number;
9. Quantity of each pesticide product applied to each treatment area;
10. Pesticide application date(s); and
11. Whether or not visual monitoring was conducted during pesticide application and/or post-application and if not, why not and whether any unusual or unexpected effects identified to non-target organisms.

7.5 Retention of Records

All required records must be prepared as soon as possible but no later than 14 days following completion of the associated activity. Operators must retain copies of these documents for a period of at least 3 years from the date their coverage under this permit expires or is terminated. The recordkeeping requirements in Appendix B, Subsection B.12 include a more general statement of the NPDES standard condition for records retention, but does not impose additional requirements on the Operator above what is required in Part 7.

EPA recommends that all Decision-makers keep records of acres or linear miles treated each calendar year for all applicable use patterns covered under this general permit. This record will help Decision-makers estimate when they will exceed the annual treatment area threshold (requiring submission of an NOI), or to complete an annual report if required.

7.6 Annual Reports

In addition to recordkeeping, EPA is requiring Decision-makers who are required to submit an NOI and are large entities as identified in Part 5 to submit annual reports that contain basic information on their pesticide discharges to Waters of the United States. An annual report form, along with instructions on how to complete it is available in Appendix G.

The annual report must include information for the calendar year, with the first annual report required to include activities for the portion of the calendar year after the effective date of the NOI. If the effective date of the NOI is after December 1, the Operator is not required to submit an annual report for that first partial year but must submit annual reports thereafter, with the first annual report submitted also including information from the first partial year. When an Operator terminates permit coverage, as specified in Part 1.2.5, the Operator must submit an annual report for the portion of the year up through the date of the termination. The annual report is due no later than 45 days after the termination date, or February 15 of the following year, whichever is earlier.

This information in the annual report will be used by EPA to assess permit compliance and to determine whether additional controls on pesticide discharges are necessary to protect water quality. For example, these data will help the Agency identify where pesticide discharges are occurring and the types of pesticides being discharged. The annual report provides specific information concerning the scope and nature of discharges permitted under the PGP.

The annual report is a summary of the pest control activities for each applicable use pattern and must contain:

a. Decision-maker's name and contact information;
b. NPDES permit tracking number(s);
c. Contact person name, title, e-mail address (if any), and phone number; and
d. For each treatment area, report the following information:
    1. Description of treatment area, including location and size (acres or linear feet) of treatment area and identification of any Waters of the United States, either by name or by location, to which pesticide(s) are discharged;
    2. Pesticide use pattern(s) (i.e., mosquito and other flying insects, weed and algae, animal pest, or forest canopy) and target pest(s);
    3. Company name(s) and contact information for pesticide applicator(s), if different from the Decision-maker;
    4. Total amount of each pesticide product applied for the reporting year by the EPA registration number(s) and by application method (e.g., aerially by fixed-wing or rotary aircraft, ground based spray, etc.);
    5. Whether this pest control activity was addressed in the PDMP prior to pesticide application;
    6. If applicable, any adverse incidents as a result of these treatment(s), for incidents, as described in Part 6.4.1; and

7. If applicable, description of any corrective action(s), including spill responses, resulting from pesticide application activities and the rationale for such action(s).

7.7 Annual Reporting for Any Decision-maker with Discharges to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit, and Who is a *Small Entity*

Any Decision-maker who is required to submit an NOI for discharges to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit, and is a small entity, as defined in Appendix A of the permit, must submit an annual report to EPA. Large entities with discharges to Waters of the United States containing NMFS Listed Resources of Concern are required to submit annual reports consistent with Part 7.6 of the permit. Decision-makers must submit the annual report electronically through EPA's notice processing system (eNOI), available at www.epa.gov/npdes/pesticides, unless eNOI is otherwise unavailable or the Decision-maker meets the waiver requirements for submitting a paper annual report. Decision-makers waived from the requirement to use eNOI for annual report submission must certify on the paper annual report submitted to EPA the rationale for eligibility to use the waiver. The annual report must be submitted to EPA Headquarters (either through eNOI or if eNOI is otherwise unavailable or the Decision-maker meets the eNOI waiver requirement, to the EPA Headquarters address identified in Part 8.1) no later than February 15 of the following year for all pesticide activities covered under this permit occurring during the previous calendar year. Annual reporting requirements begin with those discharges occurring during calendar year 2012.

When Decision-makers terminate permit coverage, as specified in Part 1.2.5, an annual report must be submitted for the portion of the year up through the date of termination. The annual report is due no later than February 15 of the next year.

The annual report is a summary of the pest control activities for each applicable use pattern that results in a discharge to Waters of the United States containing a NMFS Listed Resource of Concern, as defined in Appendix A of the permit. For small entities, discharges to waters that do not contain NMFS Listed Resources of Concern do not need to be included in the annual report. The annual report must contain:

a. Decision-maker's name and contact information;
b. NPDES permit tracking number(s);
c. Contact person name, title, e-mail address (if any), and phone number; and
d. For each treatment area, report the following information:
    1. Description of treatment area, including location and size (acres or linear feet) of treatment area and identification of any Waters of the United States, either by name or by location, to which pesticide(s) are discharged;
    2. Pesticide use pattern(s) (i.e., mosquito and other flying insects, weed and algae, animal pest, or forest canopy) and target pest(s);
    3. Company name(s) and contact information for pesticide applicator(s), if different from the Decision-maker;

4. Total amount of each pesticide product applied for the reporting year by the EPA registration number(s) and by application method (e.g., aerially by fixed-wing or rotary aircraft, ground based spray, etc.);
5. The approximate date of any discharge;
6. If applicable, any adverse incidents as a result of these treatment(s), for incidents, as described in Part 6.4.1; and
7. If applicable, description of any corrective action(s), including spill responses, resulting from pesticide application activities and the rationale for such action(s).

8. EPA Contact and Mailing Addresses

This part of the permit identifies contact information and mailing addresses for any applicable reporting requirements of this permit. Note that depending on the requirement, some reports/notifications are to go to the EPA Regional office while others are to be sent to an EPA Headquarters location. Generally, Regions are notified for information that may require rapid review and response by the Region to address potential adverse effects or other concerns requiring more immediate attention.

9. Permit Conditions Applicable to Specific States, Indian Country Lands, or Territories

Part 9.0 of the final PGP contains conditions provided by States, Territories, and Tribes as part of the Clean Water Act (CWA) Section 401 certification and consistent with the Coastal Zone Management Act (CZMA).

Section 401 of the CWA provides that all Federally-issued permits be certified by the state in which the discharge occurs. The state certifies that the proposed permit will comply with state water quality standards and other state requirements. Additionally, Section 401 provides that any certification under the Act shall set forth any effluent limitations and other limitations, and monitoring requirements necessary to assure that any applicant for a Federal license or permit will comply with any applicable effluent limitations and other limitations, standard of performance, or prohibition, effluent standard, or pretreatment standard, and with any other appropriate requirement of State and Tribal law set forth in such certification and shall become a condition on any Federal permit subject to the provisions of this section.

The Coastal Zone Management Act (CZMA) and its implementing regulations (15 CFR Part 930) require that any Federal licensed activity directly affecting the coastal zone of a state with an approved Coastal Zone Management Program (CZMP) be consistent with the enforceable policies of that approved program to the maximum extent practicable. Agency general permits that do not involve case-by-case or individualized determinations by the Agency are federal activities for the purposes of CZMA section 307(c)(1). For the final PGP, EPA made a consistency determination regarding the enforceable policies in each approved state CZM program for the coastal zones including state waters where the PGP authorizes discharges. [15 CFR 930.31(d)].

10. Permit Appendices

A. Definitions and Acronyms

Appendix A of the PGP provides permit-specific definitions of statutory, regulatory, and other terms important for understanding its requirements. Any terms that are not listed in this definitions part have the meaning given to the terms by 40 CFR Part 122.2 (the definitions section of the NPDES regulations). To develop these definitions, EPA has, where possible, relied on existing definitions in other laws and regulations applicable to this universe of permittees in order to provide consistency with those laws and provide permittees with a familiar framework.

B. Standard Permit Conditions

Federal regulations require that all NPDES permits contain the standard permit conditions specified in 40 CFR 122.41. Appendix B incorporates those standard conditions with some minor revisions to more clearly address pesticide application operations covered under the PGP. Of note, Subsection B.1 in Appendix B explains the Operator's duty to comply with the conditions of the permit with failure to do so constituting a violation of the Clean Water Act.

C. Areas Covered

As noted above, this permit is available in those areas where EPA remains the NPDES permitting authority for discharges from the application of pesticides to or over, including near, Waters of the United States. NPDES-authorized states issue permits elsewhere in the United States for these types of discharges. Appendix C includes a list of those areas where this EPA permit is available which includes portions of all ten EPA Regions where EPA remains the NPDES permitting authority. One important note to acknowledge is that the State of Alaska has received authorization to administer the NPDES program; however, EPA and the State established a three-year phase-in schedule that does not have the State issuing permits for discharges from pesticide Applicators until November 2011. EPA is including discharges from pesticide applications in Alaska in this permit such that PGP coverage is available beginning October 31, 2011 and lasting until the State of Alaska assumes responsibility for administration of these discharges.

D. Notice of Intent Form

Part 1.2.2 identifies certain Decision-makers required to prepare and submit a complete and accurate Notice of Intent (NOI) form to be authorized to discharge under this permit. Decision-makers must submit NOIs in accordance with the deadlines provided in Part 1.2.3 of the PGP. The NOI form provides EPA with the information necessary to determine a Decision-maker's eligibility to discharge under this permit, and enables EPA to better match up Operators with other reporting requirements and to prioritize oversight activities. Appendix D of the PGP contains information that is required to be provided on the NOI form. Except is special circumstances, EPA requires that Decision-makers submit that information electronically, using EPA's eNOI system that will be available for use beginning October 31, 2012 at www.epa.gov/npdes/pesticides, because it is easier (including availability of online instructions and help menus to guide you through the process), faster (NOIs can be processed 2 weeks or more faster than paper forms), and more accurate (eNOI will ensure form is completed and will

auto check certain key elements to improve accuracy of information submitted). Paper submissions are allowed if eNOI is unavailable (e.g., for discharges to Tier 3 waters that occur before October 31, 2011) or, if authorized by EPA, if the use of eNOI will cause the Operator undue burden or expense.

E. Notice of Termination Form

Part 1.2.5 of the PGP requires certain Decision-makers (i.e., those required to submit an NOI to be authorized under this permit) to submit a Notice of Termination (NOT) form within 30 days of the occurrence of one of several different triggering events: (1) when a new Decision-maker has taken over responsibility for the pest control activity, (2) the Decision-maker has ceased aquatic pesticide application covered under the general permit, (3) there is not and no longer will be pesticide discharge, or (4) the Decision-maker has obtained coverage under an individual permit or an alternative general permit. Appendix E of the PGP contains a copy of the information required to be submitted on the NOT form. Like the NOI, EPA requires that Decision-makers complete and submit the NOT form electronically using EPA's eNOI system that also will be available for use beginning October 31, 2011 at www.epa.gov/npdes/pesticides, except in specified circumstances.

F. Pesticide Discharge Evaluation Worksheet

Part 7.3 of the PGP requires Decision-makers who are required to submit an NOI and are small entities, as defined in Appendix A of the PGP, to complete and retain a worksheet for at least 3 years from when an Operator's coverage under the PGP expires or is terminated. Decision-makers are required to make this worksheet available to EPA, including an authorized representative of EPA, upon requires. Appendix F of the PGP contains a copy of the worksheet required to be retained by Decision-makers.

G. Annual Report Template

Part 7.6 of the PGP requires Decision-makers who: (1) are required to submit an NOI and are large entities, as identified in Part 5 of the PGP; and/or (2) discharge to Waters of the United States containing NMFS Listed Resources of Concern, to submit Annual Reports. The Annual Report must be submitted no later than February 15 of the following year for all pesticide activities covered under the PGP occurring during the previous calendar year. When Decision-makers terminate permit coverage, as specified in Part 1.2.5, an Annual Report must be submitted for the portion of the year up through the date of termination. Appendix G of the PGP contains a copy of the information required to be submitted with an Annual Report. Like the NOI and NOT, EPA requires that Decision-makers complete and submit the Annual Report form electronically using EPA's eNOI system that will be available for use at www.epa.gov/npdes/pesticides unless eNOI is otherwise unavailable or the Decision-maker has obtained a waiver from the requirement to use eNOI for submitting the Annual Report. A waiver may be obtained by checking the appropriate box at the top of Annual Report form and providing a brief explanation of why the waiver is needed.

H. Adverse Incident Template

Part 6.4 of the PGP requires Operators to : (1) provide oral notice to EPA within 24 hours, and (2) submit a written report within 30 days of becoming aware of an adverse incident which may have resulted from a discharge from the Operator's pesticide application. Adverse Incident, as defined in the PGP Appendix A, is an unusual or unexpected incident that an Operator has observed upon inspection or of which the Operator otherwise become aware, in which: (1) There is evidence that a person or non-target organism has likely been exposed to a pesticide residue, and (2) The person or non-target organism suffered a toxic or adverse effect. Appendix H of the PGP contains a copy of the information required to be submitted to the appropriate EPA Regional office and to the State Lead Agency within 30 days of discovering the adverse incident.

I. Endangered Species Procedures

As discussed in section 1.1.2.4 of the permit, coverage under this permit is available only for discharges and discharge-related activities that are not likely to adversely affect species that are federally-listed as endangered or threatened under the ESA or federally-designated critical habitat under the ESA, except as provided in Criterion B, C and, for 60 day, D. For discharges to a subset of these resources, identified in this permit as NMFS Listed Resources of Concern, which are defined in Appendix A, the operator must document that discharges meet these conditions by certifying eligibility under one of Criteria A-F. (Note that operators not otherwise required to submit an NOI do not need to do so merely to certify under Criterion A, which indicates that discharges will not occur to waters of the U.S. where NMFS Listed Resources of Concern are present.) Appendix I contains a four-step process that must be followed for determining whether an Operator is eligible for permit coverage, prior to submittal of the NOI. In order to become eligible for this permit, each Operator must determine its compliance with one of six criteria (A – F). If Operators cannot determine if they meet one of the eligibility criteria related to NMFS Listed Resources of Concern, the operator cannot submit an NOI to gain coverage under the PGP. In these instances, the Operator may consider applying to EPA for an individual NPDES permit.

Fact Sheet Appendices

APPENDIX A. List of pesticides and degradates which exceeded aquatic-life benchmarks in the USGS study and the draft CA Central Valley Regional 303(d) impairment list of pesticides.

Table A1. List of all pesticides and degradates which exceeded aquatic-life benchmarks in the USGS study

Pesticide/Degradate	Percentage of sites that exceed one or more aquatic-life benchmarks	
	Agricultural sites	Urban Sites
Chlorpyrifos	20.5	36.7
Azinphos-methyl	19.3	13.3
Atrazine	18.1	--
p,p-DDE	15.7	13.3
Alachlor	14.5	--
Diazinon	8.4	73.3
Malathion	7.2	30.0
Parathion-methyl	7.2	3.3
Carbofuran	6.0	--
Disulfoton	2.4	--
Diuron	2.4	6.7
Methomyl	2.4	--
Thiobencarb	2.4	--
Carbaryl	1.2	13.3
Dieldrin	1.2	3.3
Molinate	1.2	--
Parathion	1.2	6.7
Phorate	1.2	--
Propargite	1.2	--
Terbufos	1.2	--

Table A2. Pesticides/Degradates that are listed as 303(d) impairments from the CA Central Valley (Draft 2008 list)

Pesticide/Degradate	# of impairments	WQS being exceeded
Aldicarb	1	Narrative toxicity and pesticide objectives – one-tenth the 48-hr LC50 Chironomus tentans.
Azinphos-methyl	3	Narrative toxicity and pesticide objectives – USEPA ambient water quality criteria (USEPA, 1976).
Bifenthrin	1	Narrative toxicity and pesticide objectives - one tenth the 96 hour LC50 for Haylella azteca.
Carbofuran	1	Narrative toxicity and pesticide objectives – USEPA recommended water quality criterion for the protection of freshwater aquatic life.
Chlorpyrifos	63	Numeric site-specific water quality objective for chlorpyrifos or narrative toxicity and pesticides objective – exceedance of 1-hour and/or 4-day average maximum concentration criterion above the allowable frequency.
Copper (not all from pesticide sources)	18	Exceedance of 4-day average maximum concentration criterion above the allowable frequency; or exceedance of California Toxics Rule criteria.
Diazinon	46	Numeric site-specific water quality objective for diazinon or narrative toxicity and pesticides objectives – exceedances of 1-hour and/or 4-day average maximum concentration criterion above the allowable frequency.
Dichlorvos	1	Narrative toxicity and pesticides objectives – one-tenth the 96-hour LC50 for Daphnia magna.
Dimethoate	8	Narrative toxicity and pesticides objectives – one-tenth LC50 for the most sensitive species in freshwater (Cyclops strenuus, a copepod crustacean).
Disulfoton	1	Narrative toxicity and pesticides objectives – USEPA National Ambient Water Quality Disulfoton Criterion for freshwater aquatic life protection, maximum concentration of 0.05 ug/L.
Diuron	8	Narrative toxicity and pesticides objectives – the 96-hour EC50 for Chlorella pyrenoidosa (1.3 ug/L).
Malathion	3	Narrative toxicity and pesticides objectives – The USEPA recommended 4-day average criterion continuous concentration (CCC) (0.1 ug/L) (USEPA, 1976). The California Department of Fish and Game Hazard Assessment Criterion 1-hr average concentration (CMC) (0.43 ug/L) (CDFG, 1998)..
Organophosphorus Pesticides	1	Narrative toxicity and pesticides objectives – Toxicity and chemistry results indicating organophosphorus pesticide toxicity..
Oxyflurofen	2	Narrative toxicity and pesticides objectives – the 96-hour EC50 for Selenastrum capricornutum, a green algae.
cis-Permethrin	1	Narrative toxicity and pesticides objectives – one-tenth the LC50 value for the most sensitive freshwater species, Tanytarsus sp.
Prometryn	1	Narrative toxicity objective; 96-hour EC50 value for Navicula pelliculosa, a freshwater diatom.
Pyrethroids	13	Narrative toxicity objective; sediment-bound toxicity; chemical analysis; and TIE manipulations indicate pyrethroid pesticides are the likely cause.
Simazine	4	Drinking water primary Maximum Contaminant Limit (MCL) (4 µg/L).

Table A2. Pesticides/Degradates that are listed as 303(d) impairments from the CA Central Valley (Draft 2008 list)		
Pesticide/Degradate	**# of impairments**	**WQS being exceeded**
Trifluralin	1	Narrative toxicity and pesticides objectives; interpreted using LOEC for Pimephales promelas of 0.7 ug/L.

APPENDIX B. Chemicals with exceedances in USGS study and subsequent mitigation measures that reduce pesticide residues in water

Chemical	Action	Date
Alachlor	Reduced maximum application rates and frequency of application; Restricted Use Pesticide; 50 foot setback from waters for mixing and loading; state management plan; spray drift advisory; monitoring program.	1998 Reregistration Eligibility Decision (RED)
Atrazine	Intensive monitoring program	2003 Interim Reregistration Eligibility Decision (IRED)
Diuron Used monitoring data from USGS, Florida & California	Powder formulations cancelled; reduction in application rates and number of applications; no aerial applications for most crops; no treatment of home lawns	2003 RED
Thiobencarb	Application restrictions for LA, TX; label restrictions for catfish/crayfish farming; 14-day holding periods for rice farming; mixing and loading restrictions within 100 ft of water; no applications within 24 hr of rainfall	1997 RED
Azinphos-methyl	All uses to be phased out by 2012; until such time, the following measures imposed: buffer zones; limit maximum usage and frequency; spray drift requirements; prohibit aerial application on most crops; limit maximum usage and frequency	2001 IRED
Carbaryl	Lawn broadcast uses of liquid formulations cancelled; certain other uses and application methods cancelled; reduced application rates for some uses; prohibit most aerial applications	2003 IRED
Carbofuran	Most uses cancelled; for remaining six uses the Agency plans to issue a Notice of Intent to Cancel.	2006 IRED
Chlorpyrifos	Residential uses cancelled; agricultural use restrictions including reduced application rates and fewer applications per season, increase in retreatment intervals and addition of buffer zones around water bodies	2001 IRED
Diazinon	Residential uses and granular uses cancelled; aerial application cancelled; seed treatment uses cancelled	2002 IRED
Disulfoton	Cancelled some uses; reduced application rates and frequency of application for certain crops; buffers zones near water; aerial application prohibited; Notice of Receipt of Voluntary Cancellation of all Product Registrations published 7/22/09. Product Cancellation Order published September 23, 2009.	2002 IRED

Chemical	**Action**	**Date**
Malathion	Some uses cancelled; reduced application rates and frequency of application for many crops; 25 and 50 foot buffer zones for non-ULV and ULV aerial applications near water; droplet size and application altitude specifications for mosquito adulticide use; spray drift minimization label statements for agricultural and public health products; environmental hazard precautionary label statements required for agricultural, public health, and residential products	2006 RED; 2009 RED Revision
Methomyl	Reduced maximum applications rates; buffer zones; use rate restrictions; ground water and surface water advisories	1998 RED
Methyl Parathion	Cancelled several fruit and vegetable uses; mixing and loading away from water; reduced application rates and number of applications	2003 IRED
Phorate	Reduced application rates and number of applications; prohibit aerial applications; buffer zones; setbacks from wells	2001 IRED
Propargite	Reduced maximum rates and number of applications; 50 ft buffer; spray drift label requirement	2001 RED
Terbufos	Buffer zones and setbacks; reduction in sales; limited mixing and loading near water	2001 IRED
Lindane	All uses cancelled except seed treatment (2002 RED); all remaining uses cancelled effective 7/07	2002 RED; 2006 RED Addendum
Heptachlor/Heptachlor Epoxide	All uses cancelled	1978 Cancellation
Chlordane	All uses cancelled	1978 Cancellation
Molinate	All uses cancelled over 5 year period - 2008 effective date	2003 Voluntary Cancellation
Ethyl Parathion	All uses cancelled; all products phased out by 2003	2000 Cancellation
Dinoseb	All uses cancelled	1986 Cancellation
Cyanazine	All uses cancelled	1996 Cancellation

Chemical	**Action**	**Date**
DDT/DDE	All uses cancelled	1972 Cancellation
Dieldrin	All uses cancelled	1974 Cancellation
Toxaphene	All uses cancelled	1982 Cancellation
Methoxychlor	All uses cancelled	2004 Cancellation
Endrin	All uses cancelled	1995 Cancellation

APPENDIX C

Summary of Pesticide-Specific Exceedance Data and Risk Mitigation Actions

- Of the 75 pesticides and 8 degradates analyzed, 18 pesticides in use at the time of the study were measured at concentrations that exceeded EPA benchmarks: 5 herbicides (alachlor, atrazine, diuron, molinate, and thiobencarb) and 13 insecticides (azinphos-methyl, carbaryl, carbofuran, chlorpyrifos, diazinon, disulfoton, malathion, methomyl, parathion, methyl parathion, phorate, propargite, and terbufos).
- In addition, DDE, a degradate of DDT, was detected at levels in approximately 20 streams that exceeded EPA benchmarks.
- The uses for five pesticides (diuron, diazinon, chlorpyrifos, parathion, and DDT (degradate DDE)) detected by USGS have been cancelled or significantly limited.
- Five pesticides accounted for the majority of the exceedances: alachlor, azinphos-methyl, chlorpyrifos, diazinon, and malathion. These pesticides, along with atrazine, are discussed in more detail below:

Alachlor

Summary of USGS Findings:

- For alachlor, there were 14 instances where alachlor measured concentrations exceeded a benchmark. Usage of alachlor declined along with number of exceedances throughout the study and following the issuance of EPA's RED in 1998, there were no exceedances observed in the last 3 years of the study (1999 – 2001).

Azinphos Methyl

Summary of USGS Findings:

- For azinphos-methyl, there were 15 instances where azinphos-methyl measured concentrations exceeded a benchmark. All uses of azinphos methyl will be phased out by 2012.

Atrazine

History:

- Registered in 1958 as a triazine herbicide
- Initiated special review based on carcinogenic potential in 1988
- Risk reduction measures voluntarily initiated by registrant in 1990s
- Special review for triazines initiated in 1994
- January 2003 IRED specified mitigation measures to reduce risk, including intensive drinking water monitoring of 125 vulnerable CWS
- October 2003 Addendum to IRED concluded not likely to be a human carcinogen; specified ecological monitoring and mitigation program for vulnerable watersheds; and, consistent with FIFRA-SAP review, concluded that available data does not establish atrazine caused developmental effects on amphibians
- Cumulative triazine assessment to be issued later this year and may identify further risk mitigation options

Review Process:

- Extensive public participation review process during reregistration
- Extensive consultation with federal, state, and local regulatory partners, registrants, pesticides users, public interest groups, and other stakeholders
- SAP review of Agency's cancer assessment and ecological risk assessment for amphibians

Mitigation Measures:

- Product use changes required in January, 2003 IRED to reduce exposure to workers and exposure from residential uses
- Intensive and targeted monitoring program of drinking water (raw water at 125 CWS in areas of atrazine use); if atrazine exceeds EPA's safety standards, use will be prohibited in affected watershed area; complemented by routine SDWA monitoring of finished drinking water and rural well monitoring study
- Ecological monitoring and risk mitigation within 40 representative vulnerable watersheds associated with corn and sorghum production. If watershed exceeds level of concern, remediation measures will be required, and need for further expansion of monitoring will be considered.
- Implementation of testing program to evaluate potential risk to amphibians
- Continue to review ongoing epidemiology and cancer studies and amphibian studies

Summary of USGS Findings:

- Only 4 exceedances in agricultural streams for the aquatic community benchmark were observed.

Atrazine Ecological Monitoring Program

- As a condition of reregistration, the registrant must conduct a monitoring program. The purpose of program is to determine the extent to which water bodies in the most vulnerable watersheds may exceed an effects-based benchmark. If a water body exceeds a benchmark, it will be subject to mitigation measures through registrant actions, regulatory options, and/or TMDL-like watershed management programs.
- Endpoint of concern or benchmark is change in aquatic community structure, based in part, on a large number of microcosm and mesocosm studies for atrazine. This is the most sensitive endpoint and considers direct effects on fish and invertebrates and indirect effects on habitat and food sources.
- The FIFRA risk assessment and draft atrazine aquatic life criteria are based on the same endpoint and were jointly prepared.
- 40 representative vulnerable watersheds in corn/sorghum areas (Midwest) are being monitored. Monitoring in the Midwest sites will occur over three years (2004-2006) and each watershed will have a minimum of two years worth of data. Each watershed is sampled every 4 days; some watersheds are sampled daily.
- 4 vulnerable watersheds in sugarcane growing areas (LA, FL) will be monitored; sugarcane monitoring sites will have two years of data from 2005-2006.
- EPA scientists are reviewing the first 5 years of Midwest data and 2 years of the sugarcane data for Louisiana. Preliminary analysis suggests that measured

concentrations of atrazine in Missouri and Nebraska exceeded the Agency's LOC. The Agency is evaluating the sugarcane data and has not yet made a determination on those results.

Atrazine Drinking Water Monitoring Program

- As a condition of reregistration, the registrant must monitor over 130 Community Water Systems (CWSs) in areas of atrazine use in 10 states (Illinois, Indiana, Iowa, Kansas, Kentucky, Missouri, North Carolina, Ohio, Texas, and Louisiana.) If atrazine is detected above Agency standards for raw water, the use will be prohibited in that specific watershed area.
- Weekly monitoring through the growing season (generally April through July) with biweekly monitoring for the rest of the year.
- Both raw and finished water are being monitored; some CWSs have more than one raw water source measured.
- There were no exceedances of the human health benchmark, which is 37.5 ppb atrazine and its degradates based on a 90-day average in raw water.

Chlorpyrifos

History and Mitigation Measures

- Registered in 1965 as an Organophosphate ("OP") insecticide
- MOA signed with registrant in January 1997 to reduce indoor exposures
- MOA signed with registrant in June 2000 to eliminate and phase out most uses that result in residential exposure (home lawns, indoor crack and crevice treatments, and whole house post-construction termiticide treatments). These actions also mitigated risks to workers who apply chlorpyrifos and reduced risks to the environment.
- IRED issued in February 2002 included additional provisions to further reduce worker and ecological risks through label changes that included worker protection measures, buffer zones around water bodies, and rate reductions for agricultural uses.

Summary of USGS Findings:

- Chlorpyrifos exceedances were observed in approximately 20 of the agricultural streams, 10 of the mixed land-use streams, and 14 of the urban streams predominantly in the period of 1993-1994.
- For chlorpyrifos, there were 46 instances where chlorpyrifos measured concentrations exceeded a benchmark which were predominantly observed in the period of 1993-1994. Urban uses for chlorpyrifos have been banned in 2000, and in 2002 agricultural uses were changed to mitigate potential aquatic effects.
- Chlorpyrifos levels have decreased significantly since the June 2000 MOA was signed and residential uses were eliminated

Diazinon

History and Mitigation Measures:

- MOA with registrant signed in December 2000; phased out and cancelled all indoor and outdoor residential uses.
- IRED issued in May 2004 included additional measures for the remaining agricultural use products to further reduce risks to workers, birds and the environment. These measures included cancellation of certain crop uses, terminating most uses of the granular formulation, deleting most aerial applications, reducing the amount and frequency of use, adopting engineering controls, and other protective measures.
- EPA's regulatory activities have eliminated about 75% of diazinon's former uses, particularly its residential uses.
- Final water quality criteria was issued by Office of Water in 2006

USGS Results:

- Diazinon exceedances were observed in approximately 10 agricultural streams, 10 mixed land-use streams, and 20 urban streams.
- The vast majority of exceedances were associated with potential aquatic invertebrate effects.
- For diazinon, there were 44 sites where diazinon measured concentrations exceeded a benchmark.
- Since urban uses of diazinon were cancelled in 2000, concentrations have decreased significantly in urban and mixed land-use streams. A recent regional USGS study of diazinon shows declining concentrations in several urban streams in the Northeast during 1998-2004.

Malathion

Summary of USGS Findings:

- For malathion, there were 27 instances where malathion measured concentrations exceeded a benchmark.
- The revision of the malathion RED was completed in 2009. Mitigation required by the RED will reduce maximum application rates and the number of applications allowed annually when labels are revised during product reregistration, which is currently underway.