



Janice K. Brewer
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Henry R. Darwin
Director

July 17, 2012

Applicant:

Roland (Scott) Rogers, Fisheries Program Manager
Arizona Game and Fish Department
3500 S. Lake Mary Road
Flagstaff, AZ 86001

Discharging Facility:

Fossil Creek Fish Renovation
Receiving water – Fossil Creek
Lat: 34 23 15 Long: 111 39 22

**SUBJECT: Authorization to Discharge under AZPDES Pesticide General Permit;
Authorization Number: AZPEST – 300033**

Dear Applicant:

The Arizona Department of Environmental Quality (ADEQ) has received and processed your Notice of Intent (NOI) for the above-referenced pesticide discharge activity. The discharges described in the NOI are now authorized under the terms and conditions of the Arizona Pollutant Discharge Elimination System (AZPDES), Pesticide General Permit (PGP), AZG2011-001.

Please be aware this letter is not your permit but confirms your authorization to discharge pesticides directly to, over, and near Waters of the United States, when the discharge activities are conducted in accordance with permit requirements. You must be prepared to demonstrate compliance with all applicable elements of the PGP to maintain coverage and avoid possible penalties. The permit and associated documents and forms are available on ADEQ's website at:

<http://www.azdeq.gov/environ/water/permits/pgp.html>

Please keep this letter for your records and use the above Authorization Number for any inquiries or correspondence with the department. Use this number also on the Notice of Termination (NOT) which must be submitted within 30 days after 1) all anticipated discharge activities have permanently ceased; 2) coverage has been obtained under another AZPDES permit; or 3) responsibility for the discharge activity has been transferred. If you anticipate routine pesticide discharges consistent with those indicated on your NOI, you may retain permit coverage until the Pesticide General Permit expires (October 30, 2016). Please be aware you will be assessed an annual fee for retaining permit coverage.

Thank you for your attention to AZPDES compliance. If you have any questions regarding this letter or PGP requirements, please contact Christopher Henninger, Stormwater and General Permits Unit, at henninger.christopher@azdeq.gov or (602) 771-4508.

Southern Regional Office
400 West Congress Street • Suite 433 • Tucson, AZ 85701
(520) 628-6733

Pesticide Discharge Management Plan

Fossil Creek Fish Renovation
Yavapai County Arizona

Decision-maker:

Roland “Scott” Rogers
Arizona Game and Fish Department
3500 S. Lake Mary Road
Flagstaff, Arizona 85086

PDMP Contacts:

Arizona Game and Fish Department
Roland “Scott” Rogers
3500 South Lake Mary Road
Flagstaff Arizona 86001
928-214-1245
SRogers@azgfd.gov

Charles Benedict
3500 South Lake Mary Road
Flagstaff Arizona 86001
928-214-1244
CBenedict@azgfd.gov

PDMP Preparation Date:

06/12/2012

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SECTION 1: Operator Information

1. Brief description of the Pest Management Area(s):

Fossil Creek is a spring fed tributary of the Verde River located in Yavapai County. Base flows on Fossil Creek average 43 cubic feet per second (cfs). Fossil Creek is a travertine system. The primary proposed treatment area is located from a temporary fish barrier located just upstream of the confluence of Sally Mae Wash with Fossil Creek, to the permanent fish barrier in the Mazatzal Wilderness, approximately 4850 meters. The temporary barrier was constructed in fall 2011 to contain smallmouth bass that breached the permanent barrier that was damaged following heavy flows. In spring 2012, smallmouth bass were also detected above the temporary barrier. Mechanical removal of smallmouth bass upstream of the temporary barrier was conducted during the spring of 2012. We will continue to monitor the area between the temporary barrier and upstream to the former location of the Irving power plant prior to treatment. If smallmouth bass are found upstream of the temporary fish barrier in large numbers or if young of the year smallmouth bass are discovered in this location, the treatment area may be expanded and will extend from the former location of the Irving powerplant to the permanent fish barrier for a total of approximately 9850 meters.

2. Pesticide Use Patterns for this Pest Management Area that trigger the requirement to develop a Pesticide Discharge Management Plan.

- | | |
|--|---|
| a. <input type="checkbox"/> Mosquitoes and Other Flying Insect Pests | c. <input checked="" type="checkbox"/> Animal Pests |
| b. <input type="checkbox"/> Weeds and Algae | d. <input type="checkbox"/> Forest Canopy Pests |

3. Operator Type (check one):

- a. Federal Government
- b. State Government
- c. Local Government
- d. Mosquito control district (or similar)
- e. Irrigation control district (or similar)
- f. Weed control district (or similar)
- g. Other: If other, provide brief description of type of Operator:

SECTION 2: PDMP Team

1. Decision-maker:

Company or Organization Name: Arizona Game and Fish Department

Name: Roland “Scott” Rogers

Address: 3500 South Lake Mary Road

City, State, Zip Code: Flagstaff, AZ 86001

Telephone Number: 928-214-1245

Email address: srogers@azgfd.gov

Fax number: 928-779-1825

Area of Control: Project Lead

2. PDMP Contact:

Company or Organization Name: Arizona Game and Fish Department

Name: Roland “Scott” Rogers

Address: 3500 South Lake Mary Road

City, State, Zip Code: Flagstaff AZ, 86001

Telephone Number: 928-214-1245

Email address: srogers@azgfd.gov

Area of Control: Project Lead

Company or Organization Name: Arizona Game and Fish Department

Name: Charles Benedict

Address: 3500 South Lake Mary Road

City, State, Zip Code: Flagstaff AZ, 86001

Telephone Number: 928-214-1244

Email address: cbenedict@azgfd.gov

Fax number: 928-779-1825

Area of Control: Base Camp Lead

SECTION 3: Problem Identification

3.1 Pest Problem Description

1. Table of Pest Problem:

Summary of Pest Problem		
Target Pest(s) <i>Note: Use common name</i>	Source of the pest problem	Data Source (e.g. survey conducted in 2010)
Smallmouth bass upstream of the constructed (permanent) fish barrier on Fossil Creek. All fish within the target area will be removed.	Smallmouth bass in Fossil Creek downstream of the fish barrier	Smallmouth bass first reported July 2011. Smallmouth bass confirmed in July 2011. Smallmouth bass reconfirmed in June 2012

2. Brief description of the pest problem:

Located on the boundary between the Coconino and the Tonto National Forests, Fossil Creek is a major tributary of the Verde River. Originating at Fossil Springs the creek flows south and west ~14.5 miles to its confluence with the Verde River. Characterized by lush riparian vegetation and deep lagoon like pools created by calcium carbonate travertine deposits, Fossil Creek is a popular recreation area and is managed by the Arizona Game and Fish Department, US Fish and Wildlife Service, and US National Forest Service as a native fish stream.

Historically Fossil Creek is home to a variety of native fish species including roundtail chub (*Gila robusta*), headwater chub (*Gila nigra*), speckled dace (*Rhinichthys osculus*), longfin dace (*Agosia chrysogaster*), desert sucker (*Catostomus clarkii*), and Sonora sucker (*Catostomus insignis*). These unique species of fish located in Fossil Creek include species of special concern for the state of Arizona as well as threatened and endangered species. Non-native fish species, green sunfish (*Lepomis cyanellus*) and smallmouth bass (*Micropterus dolomieu*) invaded Fossil Creek in the mid 1990's and began having serious impacts on the native fish and frog community. In order to remove this threat in 2004 a barrier was constructed to prevent the upstream movement of non-native fish from the Verde River and a chemical renovation conducted. Prior to the piscicide application, native fish were salvaged prior to the treatment. The fish piscicide Antimycin A (Fintrol) was used to eradicate the unwanted fish species from the creek. Excess Antimycin was neutralized using potassium permanganate, which was applied to the stream near the man made fish barrier. In response to the renovation, fish barrier, and reintroduction of native fish to this area, native fish populations in Fossil Creek dramatically increased.

In 2011 smallmouth bass were found upstream of the constructed fish barrier, which was compromised by the 2010 winter flood. Smallmouth bass are a known predator of native fish and have extirpated several native fish populations in Arizona streams and rivers. We propose to

remove all non-native smallmouth bass and other fish in the target area with the chemical piscicide Rotenone.

3.2 *Action Threshold(s)*

1. Brief summary of the action threshold(s) in the table:

Summary of Action Threshold(s)	
Target Pests	Action Thresholds
All fish within target area will be removed.	Any smallmouth bass found upstream of the constructed fish barrier during periodic surveys.

2. Brief description of the action threshold(s):

Pest Management Objective: Eradication

Target Pest: The primary target is smallmouth bass, the secondary target is all fish to ensure complete eradication of smallmouth bass.

Action Threshold: No smallmouth bass upstream of the constructed fish barrier.

Basis for the action threshold: As few as 2 smallmouth bass upstream of the constructed fish barrier have the ability to colonize the stream and eventually destroy the native fish fishery in Fossil Creek. The high reproductive potential of smallmouth bass makes rapid colonization a reality. Mechanical removal of smallmouth bass occurred during September and October of 2011. Many bass were removed but bass remained in the system. Young of the year bass were discovered during surveys in June 2012 after the bass successfully spawned in April/May 2012.

Method to determine when the action threshold has been met: Visual observation along with electro fishing and netting.

3.3 *General Location Map*

Fossil Creek is located on the boundary between the Coconino and the Tonto National Forests, Fossil Creek is a major tributary of the Verde River. Originating at Fossil Springs the creek flows south and west ~14.5 miles to its confluence with the Verde River.

Map for this area in **Attachment A**

3.4 *Water Quality Standards*

Outstanding Arizona Water

Fossil Creek, from its headwaters at the confluence of Sandrock and Calf Pen Canyons above Fossil Springs at 34°26'48.7"/111°32'25" to its confluence with the Verde River at 34°18'21.8"/111°40'31.6" (approximately 17.2 river miles) is classified as an Outstanding Arizona Water. One of the unique attributes of Fossil Creek is that prior to the invasion of smallmouth bass, Fossil Creek was the largest and one of only a few streams in Arizona with a pure native fish assemblage. Fossil Creek is managed by the Arizona Game and Fish Department as a native fishery.

SECTION 4: Pest Management Options Evaluation

1. Description of the pest management options:

- **Target Pest:** All fish within the treatment area.
- **No Action:** The existing unique native fish community which includes threatened and endangered fish species along with fish on the candidate list would be severely impacted.
- **Prevention:** The presence of smallmouth bass in the creek is the result of flood damage to the existing fish barrier. With smallmouth bass in the creek, prevention is no longer an option. Repairs to the barrier are being completed prior the rotenone treatment to prevent future invasions of non-native fish species from downstream of the barrier.
- **Mechanical/Physical Methods:** Mechanical removal has been attempted in other stream systems with a general lack of success. Cost of mechanical removal is high with a low probability of success. Mechanical removal was attempted in September and October of 2011 and was not successful. A snorkel survey upstream of the barrier on June 6, 2012 found large numbers of smallmouth bass young of the year in the reach. These small fish are virtually impossible to catch using standard fish collection techniques.
- **Cultural Methods:** A fish barrier was constructed and the piscicide Antimycin was applied to Fossil Creek including this reach in 2004. This fish barrier along with extensive public education have been effective in keeping non-native fish species out of this reach after treatment with fish toxicants. This reach remained free of non-native fish species from 2004 until 2011.
- **Biological Control Agents:** None Available

Pesticides: Currently there are only two general piscicides licensed by the EPA for use. These registered piscicides are Antimycin A and Rotenone. Fossil Creek was successfully treated with Fintrol in 2004 to remove nonnative fish from the source of the stream to the constructed fish barrier. Fintrol is not currently available so rotenone will be applied as a piscicide to remove the smallmouth bass that invaded the stream after the partial barrier failure. The rotenone will be detoxified at the fish barrier to prevent affects downstream of the treatment reach using potassium and/or sodium permanganate. All rotenone and potassium permanganate will be applied as per the label on these products. All fish inside the treatment reach, including native fish, will be killed by the treatment. Large numbers of native fish are found just upstream of the treatment reach and will colonize the reach post treatment. In addition some unique native fish will be salvaged from the treatment reach prior to the treatment and will be released upstream of the treatment reach. Some aquatic insects may be affected by the application of rotenone but populations found upstream of the treatment reach will colonize the reach post treatment. Rotenone that is applied according to the label has a no appreciable adverse effects to non-aquatic animals and no effect on plants. The treatment area will be treated twice over a period of two weeks. This process will be *repeated as necessary*

2. Summary of Pest Management Measures that will be or are implemented to meet the technology-based effluent limitations:

Target Pest: All fish within the treatment area will be removed.

Pest Management Measures: For each necessary treatment, detoxification of the pesticide will be accomplished using potassium or sodium permanganate per the rotenone label and the rotenone standard operating procedures (SOP). The primary detoxification station will be located at the permanent barrier location. Sentinel fish will be placed downstream of the detoxification zone to insure that the detoxification is successful. A backup detoxification station will be placed downstream of the primary detoxification station and will be operated if the initial detoxification is incomplete as indicated by the sentinel fish. The detoxification station will be operated from two hours prior to the release of the rotenone until all of the rotenone applied has passed the station. A dye study will be conducted prior to the treatment to estimate the travel time and retention of the rotenone. Detoxification will continue until sentinel fish that are placed within the treatment area survive for six hours. All equipment used to apply rotenone and potassium permanganate will be calibrated prior to renovation project.

SECTION 5: Response Procedures

5.1 Spill Response Procedures

5.1.1 Spill Containment

A secondary containment area consisting of a bermed area covered with heavy plastic or a large plastic container or trough, will be set up where rotenone is transferred from the original containers to the service containers to contain minor spills during transfer of the product per the SOP. Original containers will be stored inside similarly constructed secondary containment area to contain possible leaks and spills. If a spill or leak occurs, personnel will wear the required personal protective equipment to prevent contact with product or its vapors during cleanup. Small amounts of spilled rotenone concentrate will be collected for use in the treatment if feasible or it will be covered with generous amounts of absorbent material, such as clay, diatomaceous earth, sand or sawdust. The contaminated absorbent will be swept onto a shovel and put into a salvage drum. The waste will be disposed of according to the label.

5.1.2 Spill Notification

Any spill will be reported to Scott Rogers (Project Lead) and the Base Camp Lead (Charles Benedict)

The Base Camp Lead will notify the following:

Emergency Responders if needed

Marc Dahlberg AZGFD Water Quality Lead (623)-236-7260

Forest Service Lead

Within 24 hours ADEQ's 24-Hour Hotline at (602) 771-2330 or ADEQ Water Quality Compliance Manager at (602) 771-4841

The project lead will submit a written report to ADEQ within 30 days

5.2 *Adverse Incident Response Procedures*

5.2.1 Responding to an Adverse Incident

In the event of an adverse incident the project lead will be notified and a decision will be made to either modify or halt treatment activities. An adverse incident is when a person or non-target organism may have been exposed to rotenone or have exhibited toxic or adverse effects.

The nearest emergency medical facility is located in Camp Verde and emergency responders will also have to be dispatched from Strawberry or Camp Verde.

5.2.2 Notification of an Adverse Incident

Any adverse incident will be reported to Scott Rogers (Project Lead) and the Base Camp Lead (Charles Benedict)

The Base Camp Lead will notify the following:

Emergency Responders

Medical emergencies are called in to the Strawberry/Pine Fire Department.

Main: 928-476-4272

Strawberry: 928-476-2313

Marc Dahlberg AZGFD Water Quality Lead (623)-236-7260

Forest Service Lead

Within 24 hours ADEQ's 24-Hour Hotline at (602) 771-2330 or ADEQ Water Quality Compliance Manager at (602) 771-4841

The project lead will submit a written report to ADEQ of an adverse incident within 30 days

SECTION 6: Documentation to Support Eligibility Considerations under Other Federal Laws

Fossil Creek Environmental Assessment:

An environmental Assessment (EA) was completed prior to the treatment in 2004. This previous EA is still sufficient to cover the re-treatment proposed for 2012. The original EA was written for the use of Fintrol. However, Fintrol is no longer available so we will be using rotenone. Section 18 analyses to show that the effects disclosed by the original EA are similar to those that would occur from using rotenone is being conducted by the Forest Service with support from the U.S. Fish and Wildlife Service and the Arizona Game and Fish Department. This analysis is currently being developed and will analyze the impacts of rotenone and its similarity to Fintrol. (EA Attachment G)

Fossil Creek Minimum Requirements Decision Guide:

A Minimum Requirements Decision Guide (MRDG, formerly known as minimum tool requirement) is necessary for work being done in the Mazatzal Wilderness. This document was completed by the Coconino and Tonto National Forest and was signed by its Regional Forester. This document is currently out for the mandatory 30 day public review. (MRDG Attachment H)

SECTION 7: Signature Requirements

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the application of pesticides, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____ Title: _____

Signature: _____ Date: _____

Name: _____ Title: _____

Signature: _____ Date: _____

Name: _____ Title: _____

Signature: _____ Date: _____

SECTION 8: PDMP Plan Modifications

(Reference attachment E, F and/or I)

SECTION 9: PDMP Availability

PDMP along with supporting maps and documents are available at the following locations:

Arizona Game and Fish Department
Region II
3500 S Lake Mary Road
Flagstaff, Arizona 86001

Arizona Game and Fish Department
5000 W. Carefree Highway
Phoenix, Arizona 85086

ATTACHMENTS

Attachment A – General Location Map

Attachment B – Pesticide General Permit

Attachment C – NOI and Acknowledgement Letter from EPA/State

Attachment D – Adverse Incident Report

Attachment E – Corrective Action Log

Attachment F – PDMP Amendment Log

Attachment G – Fossil Treatment Environmental Assessment

Attachment H – Minimum Requirement Decision Guide

Attachment I – Annual Reports and Other Record Keeping

Attachment I – Annual Reports and Other Record Keeping

- Copies of Annual Reports
- Records as required in PGP Part 7.4