



Michigan Department of Natural Resources – Procurement Services
P.O. Box 30028, Lansing, MI 48909
OR
525 W. Allegan, Lansing, MI 48933

NOTICE OF CONTRACT NO. 190000000932

**Between
STATE OF MICHIGAN
and**

Required by authority of 1984 PA 431, as amended.

Name and Address of Contractor Michigan State University Office of Sponsored Programs 426 Auditorium Rd., Rm 2 301 Administration Building East Lansing, MI 48824-2601	Primary Contact	
	Diane Cox	
	Email	
	Coxd@osp.msu.edu	
	Telephone	VCUST: V00048200
	(517) 884-4243	

State Contact	Division	Name	Telephone	Email
Contract Compliance Inspector	Fisheries	Marisa Lay	(517)284-5837	laym@michigan.gov
Contract Administrator	Finance and Operations	Kip Conley	(517)284-5975	Conleyk1@michigan.gov

Contract Summary			
Description (Provide a basic but comprehensive description of services)			
Using innovative engineering approaches to attempt eradication of red swamp crayfish in Michigan			
Initial Term 1 year 6 months	Effective Date 06/21/2019	Initial Expiration Date 12/13/2020	Available Options One 1-year option
Payment Terms Net 30	F.O.B. N/A	Shipped N/A	Shipped From N/A
Minimum Delivery Requirements N/A		Alternate Payment Options <input type="checkbox"/> P-Card <input type="checkbox"/> Direct Voucher (DV)	Available to MIDeal Participants <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
ESTIMATED CONTRACT VALUE AT TIME OF EXECUTION: \$205,000.00			

FOR THE CONTRACTOR:

Michigan State University

Firm Name

Diane Cox

Authorized Agent Signature

Diane L. Cox, Sponsored Programs Manager

Authorized Agent (Print or Type)

18 July 2019

Date

FOR THE STATE:

Signature

Laura Gyorkos, Manager

Name/Title

DNR Finance and Operations/Procurement

Division/Section

Date

STATE OF MICHIGAN TERMS AND CONDITIONS

I-A PURPOSE

This contract consists of the State of Michigan's (State) terms and conditions and the work statement. This contract constitutes the complete and exclusive agreement and understanding of the parties as it relates to this transaction. This contract supersedes all proposals, or other prior agreements, and all other communications between the parties relating to this transaction. If there is a conflict between the State's terms and conditions and the Contractor's Proposal, the State's terms and conditions shall take precedence.

The purpose of this contract is to obtain the services of the Department of Fisheries and Wildlife at Michigan State University to conduct research titled: Implementing and evaluating response actions for red swamp crayfish in Michigan in collaboration with Fisheries Division of the Michigan Department of Natural Resources (DNR). Project completion date is **December 13, 2020.**

I-B ISSUING OFFICE/CONTRACT ADMINISTRATOR

This contract is issued by the State of Michigan, Department of Natural Resources, Finance and Operations Division (FOD) for Fisheries Division (FD).

FOD is the only office authorized to change, modify, amend, alter, and clarify, etc., the prices, specifications, terms, and conditions of this contract. All requests for changes, modifications, amendments, etc. must be addressed to:

Kip Conley, DNR, FOD
3rd Floor, Constitution Hall
P.O. Box 30028
Lansing, MI 48909
(517) 284-5975

I-C CONTRACT STAFFING

Upon receipt of the properly executed contract agreement, it is anticipated that the person named below or any other person so designated be authorized to oversee the contract on a day-to-day basis during the term of the contract. However, oversight of this contract implies no authority to change, modify, clarify, amend, or otherwise alter the prices, terms, conditions, and specifications of this contract.

The DNR Project Manager is:

Seth Herbst, Ph.D.
Department of Natural Resources
Fisheries Division
P.O. Box 30446
Lansing, MI 48909
Telephone: (517) 284-5841
Fax: (517) 373-0381
Email: Herbsts1@michigan.gov

The MSU Principal Investigator (MSU-PI) for this project is listed below. This person is responsible for the administration and research of the project. The MSU-PI does not have the authority to change, modify, clarify, amend, or otherwise alter the prices, terms, conditions, and specifications of the contract as that authority is retained by MSU - Office of Sponsored Programs.

Dr. Brian Roth
Departments of Fisheries and Wildlife
Michigan State University
480 Wilson Rd Room 332
East Lansing, MI 48824
Telephone: (517) 353-7854
Email: rothbri@msu.edu

I-D CONTRACT COMPLIANCE INSPECTOR

Marisa Lay
Financial Analyst, DNR, Fisheries Division
P. O. Box 30446
Lansing, MI 48909
Telephone: (517) 284-5837
Email: Laym@michigan.gov

I-E PROGRAM OF WORK

Problem/Need:

The Department of Natural Resources (DNR) was notified on July 13, 2017 of the first infestation of invasive red swamp crayfish (*Procambarus clarkii*) in Michigan. The DNR Fisheries Division responded to this initial report at Sunset Lake in Vicksburg and verified the public report. A separate credible report of a red swamp crayfish infestation in a retention pond in Novi was reported to the DNR on July 17, 2017. These reports are the first known establishments in Michigan and are significant threats to Michigan's aquatic systems.

The DNR-Fisheries Division has partnered with Michigan State University on past invasive crayfish projects including a risk evaluation of red swamp crayfish introduction in Michigan. Building upon this relationship the DNR has collaborated with MSU to develop a Red Swamp Crayfish Response Plan that is currently being implemented that consists of the following five goals.

1. Determine the distributional extent of red swamp crayfish infestations
2. Implement and evaluate an early detection monitoring strategy for red swamp crayfish in high risk areas in Michigan
3. Determine the source and relatedness of red swamp crayfish infestations
4. Collect baseline biological and physical information that will inform a future assessment of impacts in areas of where effective control or eradication is not possible or feasible
5. Evaluate control measures to increase effectiveness of response efforts

The red swamp crayfish response plan is partially funded, but there is an urgent need to build capacity to implement and evaluate effective control measures in attempts to eradicate red swamp crayfish from multiple infested locations in southeast Michigan. While chemical controls (e.g., Cypermethrin) will likely

have the highest efficacy, the implementation of chemical applications will have increased non-target impacts and be more challenging to implement quickly because of the permit processing time. There is an urgent need to increase the number of available alternatives for invasive crayfish controls for resource agencies to adapt specific response actions to diverse environments. For example, in Michigan many infested ponds are relatively small privately owned retention ponds that would have limited non-target impacts and where chemical control would likely be ideal. In contrast, Sunset Lake in Vicksburg, MI is a natural lake environment where chemical control is not a feasible option and therefore other innovative technologies are vital for achieving goals of effective control to eliminate risk of adverse impacts. This project is focused on designing, implementing, and evaluating novel control alternatives that will assist with working towards the ultimate goal of eradicating red swamp crayfish in Michigan. The proposed project would be in conjunction with other ongoing work (e.g., ongoing Cypermethrin and CO2 evaluations conducted by USGS and Phyre Technologies), but differs substantially because the control solutions proposed herein are taking advantage of new and emerging innovative science and technology and focuses on field implementation at infested locations.

Project Goals and Objectives: The project objectives are directly linked with implementing Goal 5 of Michigan's Red Swamp Crayfish Response Plan. The state has partnered closely with Michigan State and other federal agencies to design and implement innovative control strategies for red swamp crayfish. The partnership between state, federal, and universities will continue and expand to include industry for implementing strategic controls that are likely to have higher effectiveness than previously documented strategies, such as intensive baited trapping. During 2017, MSU Biosystems and Agricultural Engineering Department had an undergraduate research project that evaluated sound as a potential for increasing the effectiveness of controls and preliminary results were encouraging. This project will use the initial MSU Engineering study to refine the approach and design field level controls appropriately to optimize removal efforts. The project team is also striving to diversify the available control alternatives to allow resource agencies to tailor their response properly for the given infestation.

The project objectives include:

- 1) Evaluate and implement pulsed high frequency sound (i.e., > 200Hz) with engineered traps to attract red swamp crayfish for eradication and control purposes at infested locations.
- 2) Design and manufacture automated traps for increased efficacy of red swamp crayfish trapping. This goal is primarily for locations where eradication is not feasible, such as Sunset Lake in Vicksburg, MI.
- 3) Conduct field work to evaluate the carbon dioxide-deoxygenation technology that is being developed by Phyre Technologies, Inc. and Nimune Innovations, LLC. to assist with field level control treatments.

Project Activities, Methods, Timetables:

- Lab trials will be conducted to evaluate a gradient of high frequency (e.g., 200Hz to 800+Hz) sound with different amplitudes to determine the behavioral response of red swamp crayfish. The project team will use hydrophones to determine sound gradients and amplitudes in the treatment ponds and adjust speaker power and placement to optimize installations for increasing effectiveness of crayfish trapping. The frequency evaluation is informed from previous research conducted by the MSU Biosystems and Agricultural Engineering Department as part of an undergraduate research project. We will implement a randomized block design to determine the optimal amplitude and pulse frequency for crayfish attraction. We will test four amplitudes (200Hz, 400Hz, 600Hz, and 800Hz) and four pulse frequencies for a total of 16 unique treatments. Each trial will be replicated four times, for a total of 64 trials. In each trial, crayfish will be placed in equal numbers (6-8 crayfish) across a series of three interconnected aquaria via small PVC tunnels. A speaker will be placed at one end of the aquaria chain and turned on after crayfish have been distributed in the aquaria. Each trial will run for ~12 hours inclusive of nighttime, when crayfish are most active. At the end of each trial, researchers will note how many crayfish are in each aquarium, as well as record how far individual crayfish moved. Individual crayfish will be uniquely marked using a system of colored dots placed on the carapace using nail polish. This system will also allow us to determine differences in attraction based on crayfish sex and other traits, such as size.

- Field trials with baited crayfish traps with different sound gradients will be conducted to determine effectiveness of increasing capture rates of crayfish in presence of selected sound solutions with determined sound frequencies and amplitudes. The field trials will also include fabrication and power test evaluations at MSU campus ponds to determine optimal operations before implementation at infested ponds in southeastern Michigan. Specifically, at least three trials will be conducted in at least two infested ponds using the design in Figure 1 to evaluate the effectiveness of sound for attracting red swamp crayfish into baited minnow traps. During the trials the project team will use a hydrophone to determine the observed sound gradient in the treatment ponds and will also record the catch per unit effort for each baited trap. The trials will be conducted for a 24hr period. Using the information collected the sound gradient will be adjusted accordingly to maximize removals of red swamp crayfish.

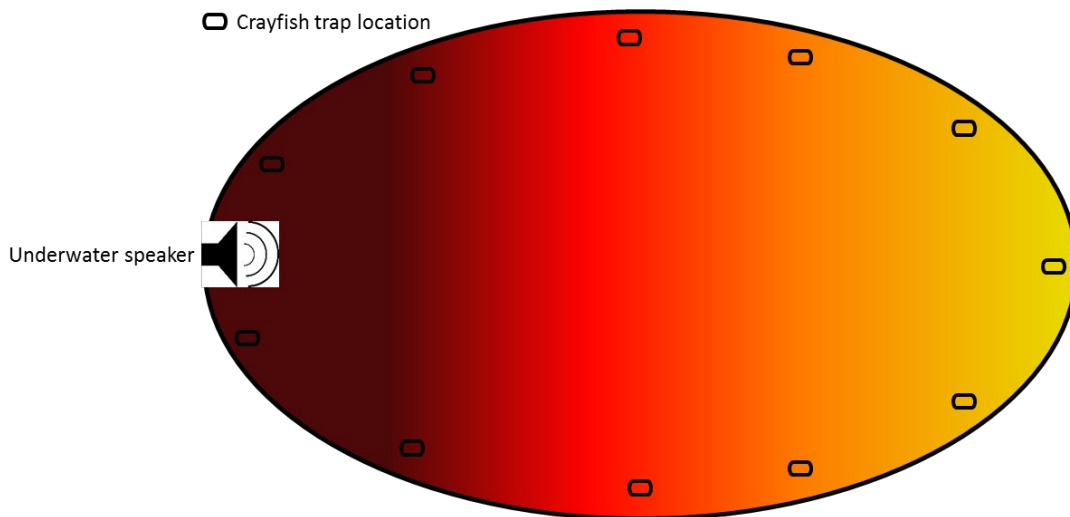


Figure 1. Conceptual model depicting the field design for evaluating the effectiveness of high frequency sound as an attractant for red swamp crayfish. The color gradient resulted to sound gradient in the pond with the dark red to light yellow illustrating the highest to the lowest frequency.

- Design a field scale automated trap that will be paired with speakers for optimal red swamp crayfish removal. The final trap design will be based off ease of use and effectiveness of control (an example is provided in Appendix 2). The total number of manufactured automated traps will be dependent upon available budget and cost of materials after final design is determined. The project team expects that up to five automated traps will be manufactured during this project for removal efforts.
- Collaborate with Phyre Technologies and USGS to design and implement lab and field carbon dioxide injections for red swamp crayfish control. Phyre Technologies, Inc has already developed a patented system for the removal of dissolved oxygen from liquids (i.e., PADS). The system de-oxygenates water by mixing it with a small volume of stripping gas that is recirculated within the system. As a by-product of the de-oxygenation process, CO₂ is also injected into the processed water increasing the effectiveness of oxygen removal. For the past several years Phyre has conducted laboratory experiments with PADS, investigating the efficacy of combined de-oxygenation and CO₂ injection for invasive species management. The current Phyre system is designed to process approximately 1 gpm water flow and this can reduce the oxygen content to below 0.1ppm in a lab setting. As part of this project the team would upscale the existing components to build a system for field demonstration and testing. This designed field unit would

be sized to process approximately 500gpm with the target oxygen levels below 1ppm. The proof of concept was initially evaluated in the lab in spring of 2018 by USGS and those trials indicated red swamp crayfish behavior is influenced by elevated carbon dioxide concentrations. Specifically, red swamp crayfish flee areas of elevated carbon dioxide which can result in highly effective hand removals of crayfish as they exit infested ponds (personal communication, Kim Fredricks, USGS La Crosse, WI). Shoreline mesh netting will also be used to entangle crayfish to ensure the highest effectiveness of removals during these treatments. While USGS methods can increase the CO₂ in ponds the dissolved oxygen doesn't reach the near zero ppm values that the Phyre Technologies machine can produce. Therefore, Phyre's PADS technology will likely provide two beneficial outcomes, which includes a flee response resulting from the elevated CO₂ concentrations and also mortality for crayfish that don't flee the pond because of the extended periods of negligible dissolved oxygen levels. The project team is partnering with USGS, so the two technologies will be evaluated and compared appropriately to provide recommendations for future treatments.

Project Monitoring and Evaluation:

The primary metric to evaluate the effectiveness of removal actions (e.g., sound or carbon dioxide) will be based on catch per unit effort (CPUE) of baited traps in infested ponds. We will also estimate the effectiveness of trapping for detecting crayfish, if present. In addition, we will estimate the proportion of sites occupied pre- and post-treatment via occupancy modeling, as described in MacKenzie et al. (2002, 2006). The conceptual basis for this analysis is that repeated sampling (e.g., using multiple traps within a water body) using traps allows one to estimate the probability that a single unit of sampling effort will detect red swamp crayfish when present. This probability can then be used, along with sampling from a random sample of water bodies to determine which water bodies are occupied after treatments occur. The project team will also use a repeated sampling design and count data from baited trapping to estimate population size of infestations using an N-mixture model (Royle 2004). The sampling efforts will be designed in such a way to be able to estimate abundance in each infested pond pre- and post-treatment to calculate a level of treatment effectiveness. The project team has initial trapping data that indicates water temperature influences capture efficiency of baited traps for red swamp crayfish. To alleviate potential bias associated with water temperature we will include that metric in the analytical model as a predictor variable to adjust model outputs appropriately.

DNR will provide the following:

- DNR PI as well as other Fisheries Division staff will provide guidance during study design development.
- DNR PI will provide assistance with field sampling efforts for sample collection, as required.
- DNR PI will assist with manuscript/report development (15%).

I-F DELIVERABLES

This contract will allow for increased capacity through the Partnership for Ecosystem Research and Management (PERM) with Michigan State University Fisheries and Wildlife Departments to design, conduct, and evaluate innovative control treatments to assist Michigan DNR with implementing the 2017 Red Swamp Crayfish Response Plan to address infestations in Michigan.

MSU PI will provide draft interim performance reports which are due 10/30/2019, 4/30/2020, and a final report which is due December 13, 2020 that will contain:

Performance reports must contain: 1) a comparison of actual accomplishments with the goals and objectives of the award as detailed in the approved scope of work; 2) a description of reasons why established goals were not met, if appropriate; 3) an enumeration and description (who, what, where, when, why, how) of any rapid response actions/exercises taken during the reporting period; and 4) any

other pertinent information relevant to the project results.

I-G PROJECT CONTROL AND REPORTS

The Contractor will carry out this project under the direction and control of the DNR, Fisheries Division.

The DNR Project Manager will meet as needed with the PI for the purpose of reviewing progress and providing necessary guidance in solving problems that arise.

The PI will submit deliverables as listed in Section I-F above, and identify any problems, real or anticipated, which should be brought to the attention of the DNR Project Manager to insure that the contract remains on schedule and will be completed as scheduled.

I-H PRICE PROPOSAL

This is a fixed price contract, and Contractor may invoice at the end of each fiscal quarter (December 31, March 31, June 30, and September 30) for 25% of the annual DNR contribution to the study (the contract cost). Contractor's fiscal contribution to this study (20%) is the waiver of normal overhead charges per the Agreement between MSU and DNR, executed in 2013.

I-I MODIFICATIONS OF CONTRACT

This contract may be modified if any changes proposed by either party are requested in writing and mutually agreed to by the official representative of the Contractor shown in this contract and the DNR contract administrator. This request is not valid until it is signed by all parties, a Contract Change Notice is issued by the Issuing Office, and a Purchase Order is issued by the DNR.

I-J NO WAIVER OF DEFAULT

The failure of a party to insist upon strict adherence to any term of this contract shall not be considered a waiver or deprive the party of the right thereafter to insist upon strict adherence to that term, or any other term, of this contract.

I-K SEVERABILITY

Each provision of this contract shall be deemed severable from all other provisions, and if one or more of the provisions shall be declared invalid, the remaining provisions of this contract shall remain in full force and effect.

I-L HEADINGS

Captions and headings used in this contract are for information and organization purposes. Captions and headings, including inaccurate references, do not, in any way, define or limit the requirements or terms and conditions of this contract.

I-M RELATIONSHIP OF THE PARTIES

The relationship between the State and the Contractor is that of client and independent contractor. No agent, employee, or servant of the Contractor or any of its subcontractors shall be or shall be deemed an employee, agent, or servant of the State for any reason.

I-N COST LIABILITY

The State of Michigan assumes no responsibility or liability for costs incurred by the Contractor prior to the signing this contract. Total liability of the State is limited to the terms and conditions of this contract.

I-O CONTRACTOR RESPONSIBILITIES

The Contractor is responsible for the performance of all of its obligations under this contract, whether the obligations are performed by the Contractor or a subcontractor. The State reserves the right to approve any subcontractor hired to perform the Contractor's obligations under this contract, and the right to require the Contractor to replace any subcontractor deemed unacceptable by the State. The Contractor is exclusively responsible for adherence by subcontractors to all provisions of this contract. Further, the State will consider the Contractor to be the sole point of contact with regard to contractual matters, including but not limited to payment of any and all costs resulting from the contract.

I-P INFORMATION RELEASE / OWNERSHIP

News Releases

News releases pertaining to this Contract or the services, study, data, or project to which it relates will not be made without prior written State approval, which will not be unduly withheld. MSU may publish information concerning the award of this in the MSU Board of Trustees report only, without prior written consent.

Publication

The Contractor will not use, release, publish or present any analyses, findings, results, or techniques developed under this agreement, or any information derived therefrom until such analyses, findings, or techniques have been reported to the State in the manner prescribed by this agreement. The Contractor will provide the State, for its review, copies of all presentations or articles being submitted for publication at least forty-five (45) days in advance. The State will review the proposed publication and provide comments. A response shall be provided to the Contractor within forty-five (45) days; otherwise, the Contractor may assume that the State has no comments. The Contractor agrees to address any concerns or issues identified by the State with respect to the State-supplied information prior to submission for publication or presentation.

Acknowledgement of State Participation/Support

All publications or oral presentations concerning the analyses, findings, results, or techniques developed under this contract will contain an acknowledgement, of the State's participation and support unless the State requests in writing that their participation and support not be acknowledged. Furthermore, Contractor may not receive fees for any article in excess of the cost of preparation of published article and excluding the cost of the research and compilation that was compensated under the contract.

Ownership of Samples\Equipment

Any samples provided by the DNR for use under this contract will remain the sole property of the DNR and must be returned upon the request of the DNR Project Manager

At the end of the project period, the DNR will retain ownership of any supplies/equipment purchased with funding under this contract and for the purposes of the project which are not consumed while completing the project. The supplies/equipment must be returned to the State upon the request of the DNR Project Manager.

I-Q DISCLOSURE

All information in this contract is subject to the provisions of the Freedom of Information Act, 1976 Public Act No. 442, as amended, MCL 15.231, et seq.

I-R ACCOUNTING RECORDS

The Contractor will be required to maintain project records pertaining to Appendix A 'Work Statement' for three (3) years from the expiration date of this contract, which access shall be made available to the State upon reasonable notice to Contractor.

I-S AUDIT OF CONTRACT COMPLIANCE

The Contractor agrees that the State may, upon 24-hour notice, perform an audit at Contractor's location(s) to determine if the Contractor is complying with the requirements of this contract. The Contractor agrees to cooperate with the State during the audit and produce all records and documentation that verifies compliance with the requirements of this contract.

I-T SAFETY AND ACCIDENT PREVENTION

In performing work under this contract on State premises, the Contractor shall conform to any specific safety requirements contained in this contract or as required by law or regulation. The Contractor shall take any additional precautions as the State may reasonably require for safety and accident prevention purposes. Any violation of such safety requirements, rules, laws, or regulations shall be a material breach of this contract and shall be grounds for cancellation of this contract in accordance with the Cancellation provisions contained herein.

I-U TAXES

Employment Taxes

Contractors are expected to collect and pay all applicable federal, state, and local employment taxes.

Sales and Use Taxes Contractors are required to be registered to remit sales and use taxes on taxable sales of tangible personal property or services delivered into the State.

I-V GENERAL INDEMNIFICATION

Each party to this contract must seek its own legal representative and bear its own costs; including judgments, in any litigation that may arise from performance specific to each party's responsibilities. It is specifically understood and agreed that neither party will indemnify the other party in such litigation.

I-W INSURANCE REQUIREMENTS

The Contractor shall purchase and maintain such insurance as will protect them from claims set forth below which may arise out of, or result from, the Contractor's operations under the Contract (Purchase Order), whether such operations be by themselves or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

NOTE: CONTRACTOR MAY SUBMIT EVIDENCE OF SELF-INSURANCE AND/OR AMENDMENT OF EXISTING LIABILITY COVERAGE IN FULFILLMENT OF ABOVE PROVISIONS, IF THE STATE ACCEPTS THE EVIDENCE OR AMENDED LIABILITY COVERAGE AS PROVIDING COMPARABLE PROTECTION OF THE STATE'S INTEREST.

The Contractor is required to provide proof of the minimum levels of insurance coverage as indicated below. The purpose of this coverage shall be to protect the State from claims which may arise out of, or result from, the Contractor's performance of services under the terms of this Contract, whether such services are performed by the Contractor, or by any subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable.

The Contractor waives all rights against the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents for recovery of damages to the extent these damages are covered by the insurance policies the Contractor is required to maintain pursuant to this contract, unless such damages are the result of the negligence or omission of the State of Michigan.

The insurance shall be written for not less than any minimum coverage herein specified or required by law, whichever is greater.

BEFORE THE CONTRACT IS SIGNED BY BOTH PARTIES OR BEFORE THE PURCHASE ORDER IS ISSUED BY THE STATE, THE CONTRACTOR MUST FURNISH TO THE DNR, FS, CERTIFICATE(S) OF INSURANCE VERIFYING INSURANCE COVERAGE. THE CERTIFICATE MUST BE ON THE STANDARD "ACCORD" FORM. THE CONTRACT OR PURCHASE ORDER NUMBER MUST BE SHOWN ON THE CERTIFICATE OF INSURANCE TO ASSURE CORRECT FILING. All such Certificate(s) shall contain a provision indicating that coverage afforded under the policies WILL NOT BE CANCELLED OR MATERIALLY CHANGED without prior written notice having been given to the DNR, FS. Such NOTICE must include the CONTRACT NUMBER affected.

The Contractor is required to provide the type and amount of insurance checked (☑) below:

- ☑ 1. Commercial General Liability with the following minimum coverage:
\$2,000,000 General Aggregate Limit other than Products/Completed Operations
\$2,000,000 Products/Completed Operations Aggregate Limit
\$1,000,000 Personal & Advertising Injury Limit
\$1,000,000 Each Occurrence Limit
\$500,000 Fire Damage Limit (any one fire)
- ☑ 2. If a motor vehicle is used to provide services or products under this Contract, the Contractor must have vehicle liability insurance for bodily injury and property damage as required by law.
- ☑ 3. Worker's disability compensation, disability benefit or other similar employee benefit act with minimum statutory limits. NOTE: (1) If coverage is provided by a State fund or if Contractor has qualified as a self-insurer, separate certification must be furnished that coverage is in the state fund or that Contractor has approval to be a self-insurer; (2) Any citing of a policy of insurance must include a listing of the States where that policy's coverage is applicable; and (3) Any policy of insurance must contain a provision or endorsement providing that the insurers' rights of subrogation are waived. This provision shall not be applicable where prohibited or limited by the laws of the jurisdiction in which the work is to be performed.
- ☑ 4. Employers liability insurance with the following minimum limits:
\$100,000 each accident
\$100,000 each employee by disease
\$500,000 aggregate disease

I-X NOTICE AND RIGHT TO CURE

In the event of a curable breach by the Contractor, the State shall provide the Contractor written notice of the breach and a time period to cure said breach described in the notice. This section requiring notice and an opportunity to cure shall not be applicable in the event of successive or repeated breaches of the same nature or if the State determines in its sole discretion that the breach poses a serious and imminent threat to the health or safety of any person or the imminent loss, damage or destruction of any real or tangible personal property.

I-Y CANCELLATION

The State may cancel this contract without further liability or penalty to the State, its departments, divisions, agencies, offices, commissions, officers, agents, and employees for any of the following reasons:

1. **Material Breach by the Contractor.** In the event that the Contractor breaches any of its material duties or obligations under this contract, which are either not capable of or subject to being cured,

or are not cured within the time period specified in the written notice of breach provided by the State, or pose a serious and imminent threat to the health and safety of any person, or the imminent loss, damage or destruction of any real or tangible personal property, the State may, having provided written notice of cancellation to the Contractor, cancel this contract in whole or in part, for cause, as of the date specified in the notice of cancellation.

In the event the State chooses to partially cancel this contract for cause charges payable under this contract will be equitably adjusted to reflect those services that are cancelled. In the event this contract is cancelled for cause pursuant to this section, and it is therefore determined, for any reason, that the Contractor was not in breach of contract pursuant to the provisions of this section, that cancellation for cause shall be deemed to have been a cancellation for convenience, effective as of the same date, and the rights and obligations of the parties shall be limited to that otherwise provided in this contract for a cancellation for convenience.

2. **Cancellation for Convenience by the State.** The State may cancel this contract for its convenience, in whole or part, if the State determines that such a cancellation is in the State's best interest. Reasons for such cancellation shall be left to the sole discretion of the State and may include, but not necessarily be limited to (a) the State no longer needs the services or products specified in this contract, (b) relocation of office, program changes, changes in laws, rules, or regulations make performance of the services under this contract no longer practical or feasible, and (c) unacceptable prices for additional services requested by the State. The State may cancel this contract for its convenience, in whole or in part, by giving the Contractor written notice 30 days prior to the date of cancellation. If the State chooses to cancel this contract in part, the charges payable under this contract shall be equitably adjusted to reflect those services that are cancelled.
3. **Non-Appropriation.** The State may cancel this contract in the event that funds to enable the State to effect continued payment under this contract are not appropriated or otherwise made available. The Contractor acknowledges that, if this contract extends for several fiscal years, continuation of this contract is subject to annual appropriation or availability of funds for this contract. If funds are not appropriated or otherwise made available, the State shall have the right to cancel this contract at the end of the last period for which funds have been appropriated or otherwise made available by giving written notice of cancellation to the Contractor. The State shall give the Contractor written notice of such non-appropriation or unavailability within 30 days after it receives notice of such non-appropriation or unavailability.
4. **Criminal Conviction.** In the event the Contractor, an officer of the Contractor, or an owner of a 25% or greater share of the Contractor, is convicted of a criminal offense incident to the application for or performance of a State, public or private contract or subcontract; or convicted of a criminal offense including but not limited to any of the following: embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, attempting to influence a public employee to breach the ethical conduct standards for State of Michigan employees; convicted under State or federal antitrust statutes; or convicted of any other criminal offense which in the sole discretion of the State, reflects upon the contractor's business integrity, the State may cancel this contract.
5. **Approvals Rescinded.** In the event any final administrative or judicial decision or adjudication disapproves a previously approved request for purchase of personal services pursuant to Article 11, Section 5 of the Michigan Constitution of 1963, and Chapter 7 of the Civil Service Rules, the State may cancel this contract. Notwithstanding any other provision of this contract to the contrary, the State Personnel Director is authorized to disapprove contractual disbursements for personal services if the Director determines that disbursements under this contract violate Article 11, Section 5 of the Michigan Constitution or violate applicable Civil Service rules or regulations. Cancellation may be in whole or in part and may be immediate as of the date of the written notice to the Contractor or may be effective as of the date stated in such written notice.

I-Z ASSIGNMENT

The Contractor shall not have the right to assign this contract or to assign or delegate any of its duties or obligations under this contract to any other party (whether by operation of law or otherwise), without the prior written consent of the State. Any purported assignment in violation of this section shall be null and void. Further, the Contractor may not assign the right to receive money due under this contract without the prior written consent of DNR Financial Services.

I-AA DELEGATION

The Contractor shall not delegate any duties or obligations under this contract to a subcontractor other than a subcontractor named in the bid unless DNR Financial Services has given written consent to the delegation.

I-BB NON-DISCRIMINATION CLAUSE

In the performance of any contract or purchase order resulting herefrom, the Contractor agrees not to discriminate against any employee or applicant for employment, with respect to their hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment, because of race, color, religion, national origin, ancestry, age, sex, height, weight, marital status, physical or mental disability unrelated to the individual's ability to perform the duties of the particular job or position. The Contractor further agrees that every subcontract entered into for the performance of any contract or purchase order resulting herefrom will contain a provision requiring non-discrimination in employment, as herein specified, binding upon each subcontractor. This covenant is required pursuant to the Elliot Larsen Civil Rights Act, 1976 Public Act 453, as amended, MCL 37.2101, et seq, and the Persons with Disabilities Civil Rights Act, 1976 Public Act 220, as amended, MCL 37.1101, et seq, and any breach thereof may be regarded as a material breach of the contract or purchase order.

I-CC UNFAIR LABOR PRACTICES

Pursuant to 1980 Public Act 278, as amended, MCL 423.231, et seq, the State shall not award a contract or subcontract to an employer whose name appears in the current register of employers failing to correct an unfair labor practice compiled pursuant to Section 2 of the Act. This information is compiled by the United States National Labor Relations Board.

A Contractor of the State, in relation to the contract, shall not enter into a contract with a subcontractor, manufacturer, or supplier whose name appears in this register. Pursuant to Section 4 of 1980 Public Act 278, MCL 423.324, the State may void any contract if, subsequent to award of the contract, the name of the Contractor as an employer, or the name of the subcontractor, manufacturer or supplier of the Contractor appears in the register.

I-DD SURVIVOR

Any provisions of this contract that impose continuing obligations on the parties shall survive the expiration or cancellation of this contract for any reason.

I-EE PERFORMANCE REVIEWS

DNR may review with the contractor their performance under the contract. Performance reviews shall be conducted quarterly, semi-annually or annually depending on contractor's past performance with the State. Performance reviews shall include, but are not limited to, quality of service being delivered and provided, timeliness, percentage of completion, accuracy of billings, customer service, completion, and submission of required paperwork, and other requirements of the contract.

Upon a finding of poor performance, which has been documented by DNR Financial Services, the Contractor shall be given an opportunity to respond and take corrective action. If corrective action is not taken in a reasonable amount of time as determined by DNR Financial Services, the contract may be canceled for default.

I-FF ELECTRONIC PAYMENT AVAILABILITY

Electronic transfer of funds is available to State contractors. Contractor is required to register with the State electronically at <http://www.cpexpress.state.mi.us>. Public Act 533 of 2004 requires all payments made by the State of Michigan be transitioned to Electronic Funds Transfers (EFT).

I-GG RENEWALS - Reserved

I-HH COMPLIANCE WITH LAWS

The Contractor represents to the best of its knowledge and belief that, in performing the services called for by this Contract, it will not violate any applicable law, rule, or regulation, or any intellectual rights of any third party; including but not limited to, any United States patent, trademark, copyright, or trade secret.

I-II LEGAL EFFECT

Contractor must show acceptance of the Contract by signing the Contract and returning it to the Contract Administrator. The Contractor must not proceed with the performance of the work to be done under the Contract, including the purchase of necessary materials, until both parties have signed the Contract to show acceptance of its terms, and the Contractor receives a Contract release/purchase order that authorizes and defines specific performance requirements.

Federal Provisions Addendum

The provisions in this addendum may apply if the purchase will be paid for in whole or in part with funds obtained from the federal government. If any provision below is not required by federal law for this Contract, then it does not apply and must be disregarded. If any provision below is required to be included in this Contract by federal law, then the applicable provision applies, and the language is not negotiable. If any provision below conflicts with the State's terms and conditions, including any attachments, schedules, or exhibits to the State's Contract, the provisions below take priority to the extent a provision is required by federal law; otherwise, the order of precedence set forth in the Contract applies. Hyperlinks are provided for convenience only; broken hyperlinks will not relieve Contractor from compliance with the law.

1. Federally Assisted Construction Contracts

If this contract is a “**federally assisted construction contract**” as defined in [41 CFR Part 60-1.3](#), and except as otherwise may be provided under [41 CFR Part 60](#), then during performance of this Contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(3) The Contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Contractor's legal duty to furnish information.

(4) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(5) The Contractor will comply with all provisions of [Executive Order 11246](#) of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The Contractor will furnish all information and reports required by [Executive Order 11246](#) of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in [Executive Order 11246](#) of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in [Executive Order 11246](#) of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of [Executive Order 11246](#) of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

2. Davis-Bacon Act (Prevailing Wage)

- a. If applicable, the Contractor (and its Subcontractors) for **prime construction contracts** in excess of \$2,000 must comply with the Davis-Bacon Act ([40 USC 3141-3148](#)) as supplemented by Department of Labor regulations ([29 CFR Part 5](#), "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction").
- b. The Contractor (and its Subcontractors) shall pay all mechanics and laborers employed directly on the site of the work, unconditionally and at least once a week, and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the advertised specifications, regardless of any contractual relationship which may be alleged to exist between the Contractor or subcontractor and the laborers and mechanics;
- c. The Contractor will post the scale of wages to be paid in a prominent and easily accessible place at the site of the work;
- d. There may be withheld from the Contractor so much of accrued payments as the contracting officer considers necessary to pay to laborers and mechanics employed by the Contractor or any Subcontractor on the work the difference between the rates of wages required by the Contract to be paid laborers and mechanics on the work and the rates of wages received by the laborers and mechanics and not refunded to the Contractor or Subcontractors or their agents.

3. Copeland "Anti-Kickback" Act

If applicable, the Contractor must comply with the [Copeland "Anti-Kickback" Act \(40 USC 3145\)](#), as supplemented by Department of Labor regulations ([29 CFR Part 3](#), "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"), which prohibits the Contractor and subrecipients from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled.

4. Contract Work Hours and Safety Standards Act

If the Contract is **in excess of \$100,000** and **involves the employment of mechanics or laborers**, the Contractor must comply with [40 USC 3702](#) and [3704](#), as supplemented by Department of Labor regulations ([29 CFR Part 5](#)), as applicable.

5. Rights to Inventions Made Under a Contract or Agreement

If the Contract is funded by a federal "funding agreement" as defined under 37 CFR §401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or subrecipient must comply with 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

6. Clean Air Act

If this Contract is **in excess of \$150,000**, the Contractor must comply with all applicable standards, orders, and regulations issued under the Clean Air Act (42 USC 7401-7671q) and the Federal Water Pollution Control Act (33 USC 1251-1387). Violations must be reported to the federal awarding agency and the regional office of the Environmental Protection Agency.

7. Debarment and Suspension

A "contract award" (see [2 CFR 180.220](#)) must not be made to parties listed on the government-wide exclusions in the [System for Award Management](#) (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

8. Byrd Anti-Lobbying Amendment

If this Contract **exceeds \$100,000**, bidders and the Contractor must file the certification required under [31 USC 1352](#).

9. Procurement of Recovered Materials

Under [2 CFR 200.322](#), a non-Federal entity that is a state agency or agency of a political subdivision of a state **and its contractors** must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at [40 CFR part 247](#) that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

Byrd Anti-Lobbying Certification

The following certification and disclosure regarding payments to influence certain federal transactions are made under FAR 52.203-11 and 52.203-12 and [31 USC 1352](#), the "Byrd Anti-Lobbying Amendment." Hyperlinks are provided for convenience only; broken hyperlinks will not relieve Contractor from compliance with the law.

1. [FAR 52.203-12](#), "Limitation on Payments to Influence Certain Federal Transactions" is hereby incorporated by reference into this certification.
2. The bidder, by submitting its proposal hereby certifies to the best of his or her knowledge and belief that:
 - a. No federal **appropriated** funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress on his or her behalf in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any federal contract, grant, loan, or cooperative agreement;
 - b. If any funds **other than federal appropriated funds** (including profit or fee received under a covered federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress on his or her behalf **in connection with this solicitation**, the bidder must complete and submit, with its proposal, [OMB standard form LLL, Disclosure of Lobbying Activities](#), to the Solicitation Manager; and
 - c. He or she will include the language of this certification in all subcontract awards at any tier and require that all recipients of subcontract awards in excess of \$150,000 must certify and disclose accordingly.
3. This certification is a material representation of fact upon which reliance is placed at the time of Contract award. Submission of this certification and disclosure is a prerequisite for making or entering into this Contract under [31 USC 1352](#). Any person making an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision is subject to a civil penalty of not less than \$10,000, and not more than \$100,000, for each such failure.

Signed by:

[Type name and title]
[Type company name]

Date: 9/13/2018

ATTACHMENT A

Project Title: "Using innovative engineering approaches to attempt eradication of red swamp crayfish in Michigan"

Proposed Budget

	June 21-Sept 30, 2019	Oct 1 2019-Sept 30 2020	
	Request	Request	Totals
Salaries & Wages	\$40,968	\$82,998	\$123,966
Liao Tech (1@\$26/hr*40 hrs*8 weeks per year)	\$9,855	\$9,136	\$18,991
Liao Hourly Lab tech (undergraduate students) (1@\$12/hr*40 hrs*8 weeks per year)	\$3,840	\$3,840	\$7,680
Liao 1/4 time Master's student (\$1050/mo 1st year plus 2.5% raise second year)	\$5,775	\$12,978	\$18,753
Roth 1/2 time Master's student (1897/mo)		\$13,279	\$13,279
Technician (1@40hrs/week * 17mos)	\$15,173	\$37,440	\$52,613
Roth hourly field tech (22 weeks at \$11.50/hr	\$6,325	\$6,325	\$12,650
Fringe Benefits	\$9,944	\$17,532	\$27,476
Liao Technician fringes @60.83%	\$5,060	\$4,842	\$9,902
Liao Hourly Lab tech (undergraduate students)	\$294	\$294	\$588
Liao Master's student (25% time enroll FS 2018)	\$860	\$929	\$1,789
Roth 1/2 time Master's student (1897/mo)		\$3,115	\$3,115
Technician (1@40hrs/week * 17mos)	\$1,161	\$2,864	\$4,025
Technician ACA (\$417/mo)	\$2,085	\$5,004	\$7,089
Roth hourly field tech (16 weeks at \$11.50/hr	\$484	\$484	\$968
			\$0

Salaries, Wages & Benefits Subtotal	\$50,912	\$100,530	\$151,442
			\$0
Travel	\$2,500	\$7,500	\$10,000
Field travel	\$2,500	\$7,500	\$10,000
			\$0
Equipment			\$0
			\$0
			\$0
Other Direct Costs	\$17,600	\$25,958	\$43,558
Field sampling supplies (clothing, waders, office supplies, etc)	\$1,800	\$5,277	\$7,077
Materials to build the capture units	\$10,000	\$5,800	\$15,800
laboratory supplies			\$0
Computers and software	\$5,800		\$5,800
publication fees		\$2,000	\$2,000
			\$0
			\$0
Tuition (for the Master student with 2.5% annual increase)		\$12,881	\$12,881
TOTAL DIRECT COSTS	\$71,012	\$133,988	
	Total	\$ 205,000	
Indirect Costs			
0% - Waived based on PERM agreement			
		\$ 205,000	