

PUERTO RICO WATER RESOURCES AND ENVIRONMENTAL  
RESEARCH INSTITUTE

104B SECTION RESEARCH PROGRAM

2<sup>nd</sup> Quarterly Progress Report

**Date of the report:** December 4<sup>th</sup>, 2006      **For Quarter Ending:** December 31<sup>st</sup>, 2006

**Project Title:** 'Use of Waste Tire Crumb Rubber to Remove Inorganic and PAHs Species from Aqueous Solutions'

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**Names of Co-PI:** Felix Roman

**Percentage of work completed in this period (%):** 25%

**Accumulative Percentage of work completed (%):** 60%

**Completion Date:** February 28<sup>th</sup>, 2007

**Project status:** Scheduled \_\_\_ Suspended X Delayed \_\_\_ Cancelled \_\_\_ Completed  
Activities progress: (according to work schedule submitted with application)

<b>Task #</b>	<b>Major Activity</b>	<b>Date started</b>	<b>% Completed</b>	<b>Estimated date of completion</b>	<b>Date Completed</b>	<b>Dependant on task(s)</b>
01	Chemical (acid) activation of crumb rubber (preliminary tests)	April 3 <sup>rd</sup> , 2006	85	January, 2007		
02	ICP-AOS calibration and preliminary sorption tests: Hg	August 15 <sup>th</sup> , 2006	10			Reparation of ICP-AOS system
03	Calibration of GC/MS system for naphthalene determination	October 15 <sup>th</sup> , 2006	90	December 2006		
04	Sorption of naphthalene by crumb rubber	November 1, 2006	10	February 2007		

**Summary of Progress on Project this Quarter:** The progress can be summarized as follows

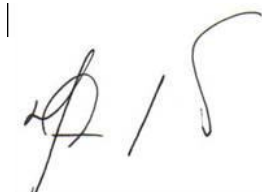
- Preliminary sorption tests using chemically activated crumb rubber mesh 14-20 and mesh 30 suggested that the removal efficiency decreased in the case of heavy metal ions. No variation was observed for the sorption of organic solvents.
- GC/MS was capable to detect naphthalene concentrations in water from 1 ppm to 10 ppb. Current efforts are focused on the determination of optimum measurement parameters to detect naphthalene concentrations as low as 1 ppb.
- A BET specific surface area analyzer and a pH-stat unit (to control pH during sorption tests) have been purchased with ADS-PR funds. Expected arrival time is January 2007.
- Preliminary sorption tests of naphthalene from aqueous solutions using mesh 14-20 crumb rubber suggest a very fast sorption. The concentration of naphthalene, measured by GC-MS, decreased from 1 ppm to 0.5 ppm after 5 minutes of contact at room-temperature.

**Problems encountered and/or assistance need:**

We are still working on the reparation of the ICP unit as well as the HPLC system in our lab. We expect to get those systems in full operation during January 2007.

**Certifications:**

*As the Principal Investigator, I certify that the information contained within this quarterly report accurately reflects the status of this project.*



Dr Oscar Perales-Perez, PI  
Associate Professor

December 4<sup>th</sup>, 2006