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*SWANA Applied Research Foundation - F2017 Disposal  
Group Research Project Guide*

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# Benchmarking Landfill Performance



**November 10, 2016**

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## 1.0 INTRODUCTION

### 1.1 The SWANA Applied Research Foundation

The Solid Waste Association of North America (SWANA) is an organization of more than 8,500 public and private sector professionals committed to advancing from solid waste management to resource management through their shared emphasis on education, advocacy and research. For more than 50 years, SWANA has been the leading association in the solid waste management field. SWANA serves industry professionals through technical conferences, certifications, publications and a large offering of technical training courses.

In 2001, the SWANA Applied Research Foundation (ARF) was conceived through the vision and commitment of a group of founding Subscriber organizations. The goal of the SWANA Applied Research Foundation is simple – to support SWANA’s mission through the leveraging of research dollars to conduct collective and cooperative applied research projects that address pressing solid waste issues.

During fiscal year 2017 (FY2017), the SWANA ARF is being conducted as an adjunct program of SWANA. The SWANA ARF is managed by Jeremy K. O’Brien, P.E., SWANA’s Director of Applied Research.

### 1.2 The FY2017 ARF Disposal Group

A total of twenty-five local governments, authorities, SWANA Chapters and private companies are subscribers that have joined the SWANA ARF’s FY2017 Disposal Group. Each of these organizations have made a “\$0.011 per ton” or similar funding commitment to support the conduct of collective applied research which, in turn, supports SWANA’s mission of *“Advancing from solid waste management to resource management.”*

A listing of the FY2017 Disposal Group Subscribers is provided in Table 1.

Jurisdiction	Representative	Title
Chester County Solid Waste Authority (PA)	Robert Watts	Executive Director
Delaware County Solid Waste Authority (PA)	Joseph Vasturia, PE	Chief Executive Officer
Delaware Solid Waste Authority (DE)	Richard Watson, PE, BCEE	Chief Operating Officer
City of Denton (TX)	Scott Lebsack	Assistant Director of Solid Waste
Illinois SWANA Chapter	Steven Schilling, P.E.	President SWANA Land of Lincoln Chapter
Iowa SWANA Chapter	Mike Classen	Solid Waste Engineer (HDR)
King County (WA)	Laura Belt	Special Projects Manager



**TABLE 1**  
**SWANA Applied Research Foundation - FY2017 Disposal Group Subscribers**

Jurisdiction	Representative	Title
Lancaster County Solid Waste Management Authority (PA)	Robert Zorbaugh	Chief Operating Officer
Los Angeles County Sanitation Districts (CA)	Frank Caponi	Division Engineer
Mecklenburg County (NC)	Jeff Smithberger	Director, Solid Waste Management
Metro Waste Authority (IA)	Jeff Dworek	Director of Operations
New Jersey SWANA Chapter	Gary Conover	Solid Waste Director - Atlantic County Utilities Authority
New River Resource Authority (VA)	Joseph Levine, PE	Executive Director
New River Solid Waste Association (FL)	Darrel O'Neal	Executive Director
North Carolina SWANA Chapter	Joe Readling, PE	Vice President - HDR Engineering, Inc.
Prince William County, VA	Tom Smith	Solid Waste Division Chief
San Joaquin County, CA	Jim Stone	Deputy Director of Public Works
SCS Engineers	Robert Gardner, PE, DEE	Senior Vice President
Smith Gardner, Inc.	Mike Brinckek	Senior Project Manager
Solid Waste Authority of Central Ohio (OH)	Scott Perry	Operations Director
Solid Waste Authority of Palm Beach County (FL)	Mark Hammond	Executive Director
City of Tucson (AZ)	Martin Bey	Landfill Manager
Waste Commission of Scott County (IA)	Kathy Morris	Director
Winston-Salem City/County Utilities (NC)	Jan McHargue, PE	Solid Waste Administrator
Wisconsin SWANA Chapter	Chris Anderson	Foth Infrastructure and Environment, LLC

## 2.0 PROJECT DEFINITION

In July 2016, the Disposal Group Subscribers were asked to identify and submit applied research needs that were of importance to their organizations. These needs were then compiled and distributed to the Subscribers, who were given the opportunity to discuss them at a meeting held at WASTECON 2016 in Indianapolis, IN on August 24<sup>th</sup> or a conference call held the following week on September 7<sup>th</sup>. Minutes for the WASTECON meeting and the conference call were prepared and distributed to the subscribers for their review and comment. Following the meeting and conference call, the subscribers were then asked to vote for their top three preferences.

The results of the voting, which are presented in Table 2, were discussed in a conference call held on October 19, 2016. Based on the meeting and conference call discussions, it was decided that the ARF should conduct research in FY2017 on the following top-ranked topic:

- **Benchmarking Landfill Performance.**



<b>Table 2. Results of Voting For FY2017 Applied Research Topics</b>				
	<b>Organization</b>	<b>Topic</b>	<b>Score</b>	<b>Rank</b>
1	SWANA New Jersey Chapter	Hydrogen Sulfide Emissions at Landfills	5	
2	King County, WA	Unmanned Aerial Systems For Landfill Surveying and LFG	8	
3	SWANA North Carolina Chapter	Wet Vs. Dry Burial Evaluation	9	3
4	SWANA North Carolina Chapter	Odor Detection and Control - State of the Practice	8	
5	SWANA Land of Lincoln Chapter	Solid Waste Disposal Facility Safety Best Practices	14	2
6	City of Winston-Salem Utilities	Benchmarking Landfill Performance	19	1

This topic - which was submitted by the City of Winston-Salem Utilities - was described as follows:

"The 2008 ARF report on Benchmarking the Performance and Costs of Landfills is a valuable resource for landfill owners/operators interested in analyzing operational metrics such as equipment, staffing, airspace utilization, waste-to-cover ratios, etc. Given the period of time that has passed since that data was compiled, an updated version of this report would support facility operators in ongoing efforts to increase efficiency and effectiveness. A shared database could be created to accompany the report, allowing operators to access information and provide updates to keep the data current."

### 3.0 PROJECT APPROACH

The 2008 ARF presented the results of a two-year effort to develop a SWANA MSW Landfills Benchmark database as well as an analysis of the database information. During that effort, SWANA ARF staff developed a “MSW Landfill Benchmarking Survey” that was distributed to the ARF subscribers as well as the members of the SWANA Landfill Technical Division.



Completed survey questionnaires were received and analyzed from eight ARF subscribers and sixteen SWANA Landfill Tech Division members.

The purpose of the current project is to update and expand the report and database developed during the 2008 project. In addition to updating the survey questionnaire and soliciting, compiling and analyzing the responses, two additional activities will be conducted during this project to enhance its effectiveness.

- **Collaboration with the Environmental Research and Education Foundation** - In October, 2016, SWANA signed a "Memorandum of Understanding" with the Environmental Research and Education Foundation (EREF) to foster cooperation and collaboration between the two research organizations. During this project, SWANA will make an effort to engage the assistance of EREF staff in the collection, compilation and review of landfill benchmarking data.
- **Conduct of Landfill Benchmarking Session at SWANAPalooza 2017** - During the conference call held on October 19th, it was suggested that a session be organized and conducted at SWANAPalooza 2017 to promote participation in the benchmarking project by conference attendees. The session will consist of a roundtable discussion of the benchmarking programs and needs by a select number of the ARF Disposal Group Subscribers. Ideas and suggestions will be then solicited from the session attendees regarding how the benchmarking project could better designed and/or conducted to benefit their landfill operations. The planning and conduct of this session will be conducted as a research task during this project.

## 4.0 PROJECT WORK PLAN

### 4.1 Task 100 – Project Management

**Objective:** To develop and manage a project that will accomplish the goals and objectives of the ARF Disposal Group Research Project.

**Subtasks:**

- Develop project objectives and approach.
- Finalize work scope and schedule.
- Distribute and document project communications.
- Develop formats for project deliverables.



- Project management.

**Deliverables:** Finalized work scope and project schedule.

#### 4.2 Task 200 – Subscriber Meetings

**Objective:** To plan and conduct project meetings and site visits that will enable Subscriber Representatives to participate in the conduct of the project and to interact with each other as well as technical experts and project staff.

Three Subscriber Representative Meetings have been planned in conjunction with this project.

- **Project Development Meeting** - A meeting was held in conjunction with WASTECON 2016 in Indianapolis to discuss the research topics submitted for consideration for FY2017 research.
- **Project Review Meeting** – A project meeting will be held in conjunction with SWANAPalooza 2017 scheduled for March 27-30, 2017 in Reno, NV. A progress report will be presented at the meeting.
- **Report Review Meeting** – A meeting will be held at WASTECON 2017 in Baltimore. The purpose of this meeting will be to solicit comments on draft work products as well as to review and discuss the research topics submitted for consideration for FY2018 research.

**Subtasks:**

- Secure meeting rooms and confirm meeting dates.
- Develop background materials and meeting agendas.
- Arrange for meeting logistics.
- Conduct meetings.
- Prepare and distribute meeting summaries.

**Deliverables:**

- Meeting Summaries - documenting the participants, activities, discussions and distributed meeting materials - will be prepared and distributed to all Subscriber Representatives.



**Key Understandings:** It is SWANA’s understanding that Subscriber representatives will be responsible for covering their travel costs associated with the project meetings.

#### 4.3 Task 300 - Conduct Applied Research

The following subtasks will be conducted in conjunction with this task:

- **Subtask 310: Review and Refinement of Survey Instrument** - The survey instrument utilized in the FY2008 benchmarking project will be distributed to the Disposal Group Subscribers for their review and comment. Additional input will be requested from industry experts such as Neil Bolton of Blue Ridge Services.
- **Subtask 320: Collection of Benchmarking Data for Public Sector MSW Landfills** - The objective of this subtask is to collect additional MSW landfill benchmarking data from ARF Disposal Group subscribers, Landfill Tech Division members, and other public sector landfill owners.
- **Subtask 330: Analysis of Survey Data** - The objective of this subtask is to review and analyze the landfill benchmarking data from public sector landfill owners. The subtask will include the following efforts:
  - Review survey data for reasonableness and completeness.
  - Conduct follow-up interviews, as needed, with public sector landfill owners to complete surveys.
  - Analyze survey data and develop relevant tables and mathematical relationships for benchmark parameters.

**Deliverables:** Expanded and updated database of benchmarking data from public sector landfill owners.

#### 4.4 Task 400 - Preparation of Project Report

**Objective:** To finalize and publish a report on the FY2017 research topic.

**Subtasks:**

- Submit draft report to ARF Disposal Group Subscribers for review and comment.
- Prepare and publish final report.

**Deliverables:** Final report on FY2017 research.





## 5.0 PROJECT SCHEDULE AND BUDGET

The proposed schedule for this project is presented below. As indicated, the project is designed so that a draft version of the project report is completed by September 2017.

Also indicated on the schedule are three Subscriber meetings that are being planned in conjunction with this project. It is SWANA's belief that the participation of Subscriber Representatives in these meetings will greatly enhance the value of this project to the Disposal Group.

		<b>SWANA APPLIED RESEARCH FOUNDATION</b>																	
		<b>FY2017 ARF DISPOSAL GROUP PROJECT SCHEDULE</b>																	
Fiscal Year		FY2017						FY2018											
Calendar Year		2016			2017			2017			2018								
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Task</b>	<b>Description</b>																		
1	Project Management	—————																	
	Identification of FY2017 Research Topics	—————																	
	Finalization of FY2016 Report				—————														
	Development of Project Guide				—————														
2	Subscriber Meetings	X					X						X						
3	Conduct of Research: Benchmarking Landfills					—————													
4	Preparation of Final Report													—————					

The proposed budget for this project is presented below.

<b>Proposed Budget - SWANA Applied Research Foundation: FY2017 Disposal Group Project</b>													
Task No.	Task Description	Total Hours	Total Labor (\$) (Inclu. Fr.)	Expenses (\$)								Total Exp. (\$)	Total Cost (\$)
				Travel	Clerical	Sub Constl.	Copy/ Mail	Tel.	Indirect Cost Charge	Misc.			
1	Project Management	24	2,725				200	1,200				1,400	4,125
2	Subscriber Meetings	24	2,725	2,000								2,000	4,725
3	Conduct of Research: Benchmarking Landfill Performance	240	27,245									-	27,245
4	Preparation of Final Report	120	13,623									-	13,623
<b>TOTALS</b>		<b>408</b>	<b>46,317</b>	<b>2,000</b>	<b>0</b>		<b>200</b>	<b>1,200</b>	<b>53,033</b>	<b>1,000</b>	<b>3,400</b>	<b>107,150</b>	



## 6.0 PROJECT TEAM

**Mr. David Biderman** will serve as **Project Director**. Mr. Biderman is the President and CEO of SWANA. As Project Director, Mr. Biderman will be responsible for committing the resources of the organization to the successful completion of this project. Mr. Biderman has more than 20 years of experience in the environmental industry. He was employed by the National Solid Waste Management Association for many years, most recently serving as the Association's General Counsel and Vice-President, Government Affairs.

**Mr. Jeremy K. O'Brien, P.E.** will serve as **Project Manager**. Mr. O'Brien has served as SWANA's Director of Applied Research since 1999 and has over 30 years of experience in the energy and environmental management consulting industry. From 1991 to 1999, Mr. O'Brien was Project Manager/Senior Professional Associate for HDR Engineering, Inc. Mr. O'Brien has conducted projects covering all facets of solid waste management including the planning, design, and evaluation of recycling, collection, waste-to-energy, composting, and landfill facilities and systems.

As Project Manager, Mr. O'Brien will serve as the primary liaison between the Disposal Group Subscribers and SWANA and will be responsible for the project's timely completion within the allocated budget.

