Material Segregation Project
Grand Isle, Louisiana
August 2013

TABLE OF CONTENTS

PURPOSE:

The purpose of this project is to gather information that provides GCIMT data relevant to weight distribution of MC252 material to non-MC252 material on Grand Isle. This will be approached in a scientific manner to ensure that relevant sample sizes are taken, that correct levels of randomness are introduced, and that reporting will be of a factual nature. Additionally, it should be noted that the program leading to this information is geared towards participation from the USCG, State of Louisiana, and BP to ensure that all parties are cognizant of the approach, methods used, and final report.

Note: Louisiana declined to participate in the GCIMT's development of this plan and declined the FOSC's invitation to provide comments or input.

BACKGROUND:

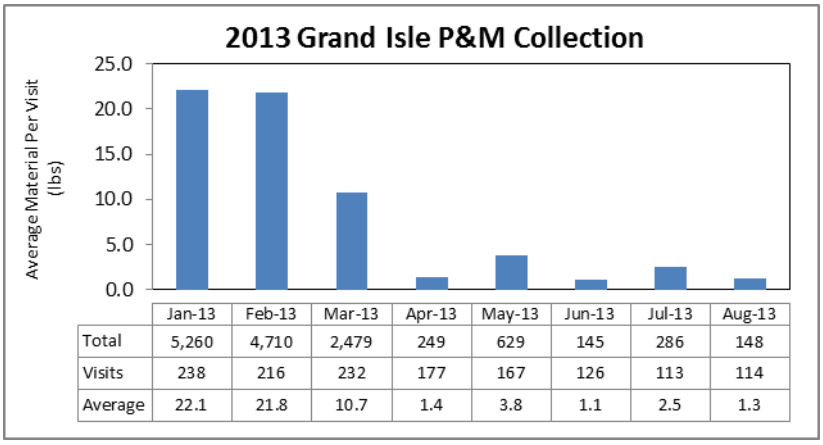
Prior to segment based reporting, Louisiana's waste stream yielded 76,062,800 lbs. of oily solids between May 2010 and May 2011. These oily solids are comprised of oil-impacted solid materials that may include debris, vegetation, protective clothing, etc. collected during clean-up activities. Following May 2011, all areas within the response began recording material collection on a segment or zone level basis.

Between June 1, 2011 and August 31, 2013, 12,165,569 lbs. of material was collected in Louisiana. This brought the total material collection plus oily solids to 88,228,369 lbs. The material collection reported after June 1, 2011 is characterized as a mixture of sand with oil, materials (e.g. sand and shells) with a coating of oil and incidental material picked up in the cleaning process. The greatest proportion of the material collected is material other than oil. Louisiana material collection includes water-saturated mats, SRBs and SRPs, organics, and other material.

From January 2012 through August 2013, field operations in Louisiana yielded 9,174,914 lbs. of collection. Of that collection, 7,666,225 lbs. of it was captured through special projects which include LAASR, BOP, Snorkel SCAT, and the Fourchon Zone 3 breach removal and backfill. Less than 5% of collection totals in 2013 are a result of regular P&M activities with only 150,437 of the 3,100,732 lbs. of total 2013 collection. The total collection includes both MC252 and non-MC252.

Activity	First Collection	Last Collection	Material Collection
BOP	22-Jun-13	30-Aug-13	81,568
LAASR	8-Jan-13	2-Aug-13	2,652,730
Snorkel SCAT	18-Feb-13	31-Jul-13	215,998
Fourchon Gross Removal	13-Nov-12	9-Dec-12	4,716,000
Total	**-**	**-**	**7,666,225**

Grand Isle saw significant material collection due to LAASR in 2013; however, normal P&M activities continue to yield very low collection amounts. LAASR accounted for over 96% of 2013 Grand Isle collection with 402,098 lbs. The remaining 13,906 lbs. were recovered across 1,383 zone visits. Those visits demonstrated a steady decline in collections following the April and May activity of LAASR. The chart below displays this decline.



	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13
Total	5,260	4,710	2,479	249	629	145	286	148
Visits	238	216	232	177	167	126	113	114
Average	22.1	21.8	10.7	1.4	3.8	1.1	2.5	1.3

It was believed that even these low collections of material did not truly represent the MC252 being collected. The material collection on Grand Isle often consisted of shell hash, which was not documented, and non-MC252 in addition to the MC252 collected. The material segregation project was conceived to document these occurrences.

SEGREGATION PLAN:

The Material Segregation Plan was developed to scientifically characterize the material collections on Grand Isle beach. To accomplish this, sufficient samples of material are needed to provide a statistically representative and unbiased data set. This would encompass the entire collection including shell hash, MC252, and Non-MC252. The sampling would render a high degree of confidence and low margin of error. Additionally, material identified as visually consistent with MC252 would be sent to the lab for a gravimetric analysis to determine the sample's oil percentage.

Prior to the plan's execution, NOAA and BP science advisors reviewed it for scientific and statistical validity. All agreed that the plan contained the appropriate scientific rigor to provide statistically significant and relevant results.

Following the scientific review, the USCG, State of Louisiana, NOAA, and BP met to review the plan and agreed to proceed. The Louisiana SOSC objected to the State's involvement. A second meeting was conducted to address the Louisiana SOSC's concerns; however, the State maintained its position to not participate. Although the SOSC maintained the State's position, the FOSC encouraged Louisiana to change its position and support the project. Likewise, BP encouraged the state of Louisiana to at least have a person witness the work conducted for this project even though they do not support it. The USCG stated they would

support the Material Segregation Project. Despite the State's protest, the FOSC signed his approval of the project on August 27, 2013.

Sampling for the Material Segregation Project commenced collection on August 1st, 2013 and ran until August 31, 2013. All 14 zones of Grand Isle were included. The project was only focused on SRB collection captured during regular P&M. Any occurrence of mat collection or material resulting from a special project would not be considered.

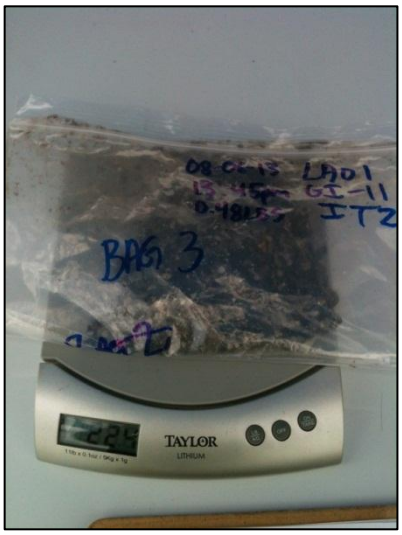
Operations collected 148 lbs. of material from 114 visits to the 14 Grand Isle zones in August. The Material Segregation Plan was written to select samples such that the sample size was sufficiently large and samples were representative of the population. To do this, all bags of material from zones 1 – 10, and zone 14 were candidates for material segregation. The numbers of visits and resulting bags in zones 11 – 13 are often higher than other zones, so those bags were selected using a Random Selection Tool written specifically for this project.

August 2013 Collection		
Zones	Visits	Material (Lbs)
GI-1	3	0
GI-2	3	0
GI-3	3	0.03
GI-4	3	0.04
GI-5	4	0.02
GI-6	4	0.11
GI-7	4	0.66
GI-8	10	10.19
GI-9	8	1.23
GI-10	9	1.06
GI-11	17	10.2
GI-12	17	14.65
GI-13	17	51.98
GI-14	12	58.24
Total	**114**	**148.41**

The Random Selection Tool uses a randomizer designed by Microsoft and embedded in Microsoft Excel which allows records to be randomly selected. For the Segregation Plan's use, the algorithm randomly selected 25% of the bags. During the collection period, there were 51 visits for zones 11 – 13. These visits yielded 74 bags of material, which the Random Selection Tool chose 18 for material segregation.

The August collection resulted in 134 bags of material weighing 141.08 lbs from 114 visits. Of this material, 64 bags were chosen for material segregation weighing 60.33 lbs.

SEGREGATION OF MATERIAL:



Material collected was stored in a locked JoBox until segregation began. Two bags of material were segregated on August 2nd, 2013 to test the segregation method. The remaining material did not begin segregation until August 23, 2013. The delay stemmed from the lack of consensus to proceed.

The bags were weighed prior to segregation. Although the material had been previously weighed at the time of collection, it was weighed again to ensure consistency with the measuring device. A digital scale weighed the bag, and the data were recorded in grams.

A team of Danos technicians separated shell hash from SRBs. This segregation was done with the oversight of the Coast Guard. Once the shell hash had been separated out, the remaining SRBs were then separated into piles of visually consistent MC252 and suspected non-MC252. The separation of MC252 from non-MC252 was done by Blake Scott and Peter Engebretson along with the Coast Guard and a SCAT/Ops

Liaison. The segregated material was put into three piles (shell hash, MC252, and non-MC252) and each pile was weighed. The weights were documented on a Material Segregation Log. The product was placed on a whiteboard with the recorded weights below each pile and the sample was documented with a photo.

The weights of the shell hash, visually consistent MC252, and suspected non-MC252 were measured in the following proportions:

Visually Consistent MC252:	66.7%
Suspected non-MC252:	1.2%
Shell Hash/Other material:	32.1%

The oiled material, both visually consistent MC252 and suspected non-MC252, was sent to the lab for fingerprinting analysis or percent oil content analysis. A Cardno-ENTRIX representative collected the samples, followed approved procedures to collect, document, and transport the material using chain-of-custody forms. These forms gave each sample a unique ID to ensure accuracy and tracking.

ANALYSIS OF OILED MATERIAL:

Suspected non-MC252 material was observed in 26 samples across 7 zones. To verify this material was not MC252, 1 sample was randomly selected from each of the 7 zones and sent to the lab for a fingerprint analysis. The lab interpretation of the 7 suspected non-MC252 samples was noted as “Draft—Not MC252 crude oil”.

The lab analyzed 118 samples identified as visually consistent with MC252 to determine the percent oil content of each sample. Due to the composition of the material, the samples were split into two groups: OTS and TRB.

The lab classified the TRB and OTS groups using its professional judgement based on characteristics of the sample in the sample jar. A TRB matrix sample is one that from visual observation appears to be mostly oil. The OTS matrix deals with smaller amounts of oily material that is attached or included with other material such as shell hash or other debris.

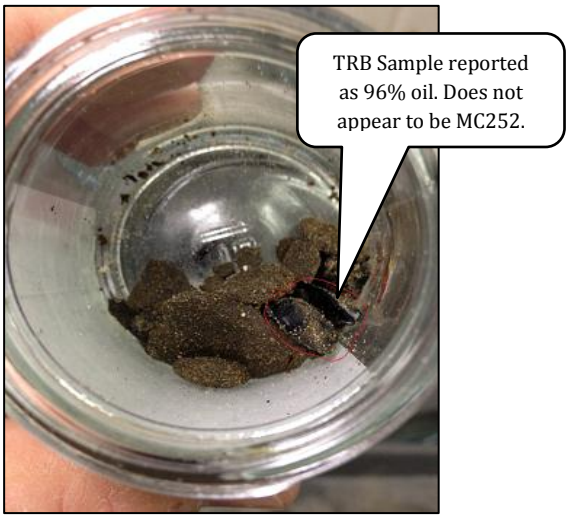
There were 47 samples analyzed in the OTS matrix group. A distribution analysis determined the sample group met the necessary criteria to be described using a t-distribution. The analysis below illustrates that the OTS matrix samples contained 5.5% oil with a margin of error of 2%. This analysis was performed with 95% confidence.

Overall OTS matrix	N	Mean	St Dev	SE Mean	LCI	UCI	E
%MC252	47	0.0549	0.0629	0.0092	0.0364	0.0734	0.0185

N – Sample Size
Mean – Average of the sample set
St Dev – Standard Deviation
SE Mean – Standard Error about the mean
LCL – Lower Confidence Interval about the mean
UCL – Upper Confidence Interval about the mean
e – Error

The TRB matrix group was comprised of 71 samples. All of the samples contained a percentage of oil that ranged between 7% and 20% except 5 outliers. These outliers contained percent oil content on both extremes of the mean.

The high extreme outlier was a TRB sample with 96% oil content. An oil content of 96% was calculated to be more than 8 standard deviations above the mean. This is extremely rare. For example, a data point measured at 4 standard deviations occurs only about 32 times out of every million opportunities, whereas a point at 5 standard deviations occur only about 3 out of every 10 million opportunities. Given this rare possibility, the lab reconfirmed their results. They confirmed with high certainty that the sample contained 96% oil. Upon receiving these results, the lab was asked to provide a photo of the sample in question (see right). The dark and refined look of the SRB led to suspicions that this material was non MC252. The lab was asked to do a fingerprint analysis on the material. The analysis confirmed that the sample was not MC252. This data point was removed from the TRB dataset.



The other 4 outliers were on the low extreme of the mean. Their percent oil measured: 0.13%, 0.07%, 0.01%, and 0.45%, each of which is approximately 5 standard deviations below the mean. Since they contained such a small amount of oil and considering the unlikelihood that these samples represent the population, they were removed from the TRB dataset. Keeping these would falsely deflate the mean and provide a larger standard deviation, which would yield a greater margin of error.

The lab analyzed the remaining 67 TRB matrix samples in the same manner as the OTS sample matrix. They also met criteria to be described using a t-distribution. The analysis

below illustrates that the TRB matrix samples contained 11.6% oil with a margin of error of approximately 1%. This analysis was performed with 95% confidence.

Overall TRB matrix	N	Mean	St Dev	SE Mean	LCI	UCI	e
%MC252	66	0.1163	0.0242	0.0030	0.1104	0.1223	0.0060

COMBINED RESULTS:

The table and graphic below break down the segregated material data. The 66.7% MC252 material was divided into the TRB and OTS matrix subgroups. In those groups, the OTS matrix yielded 5.5% oil within its subgroup, or 1.5% of the overall material. The TRB matrix yielded 11.6% oil within its subgroup, or 4.4% of the overall material. The material that was other than oil from both the TRB and OTS matrix subgroups was 58.5% of the overall material. When the 58.5% of non-oiled material from the TRB and OTS matrix subgroups is added to the 1.2% non-MC252, the 32.1% material other than oil, and the 2.3% outliers, the material recovered from P&M on Grand Isle during the month of August 2013 was 94.2% material-other-than-oil and only 5.8% oil contained within the material that was visually consistent with MC252.

	Segregation Weight (0)	Samples per Category (1)	Distribution of MC252 (2)	Weight of Oil per MC252 (3)	Weight Distribution (4)	Rules of Thumb
Non-MC252	1.2%		-	-	1.2%	1.2%
Other	32.1%		-	-	32.1%	32.1%
MC252	66.7%	117	100%		66.7%	-
Outlier		4	3.4%		2.3%	2.3%
OTS		47	40.2%	100%	26.8%	-
% Oil				5.5%	1.5%	1.5%
% Other				94.5%	25.3%	25.3%
TRB		66	56.4%	100%	37.6%	-
% Oil				11.6%	4.4%	4.4%
% Other				88.4%	33.2%	33.2%

Notes:

0 - The total weight of raw material segregated into three categories (Non-MC252, Other, and MC252)

1 - The number of samples that were sent to the lab.

2 - This distribution of samples into their analysis subsets.

3 - The distribution from each of the sample sets as % oil vs. other weight

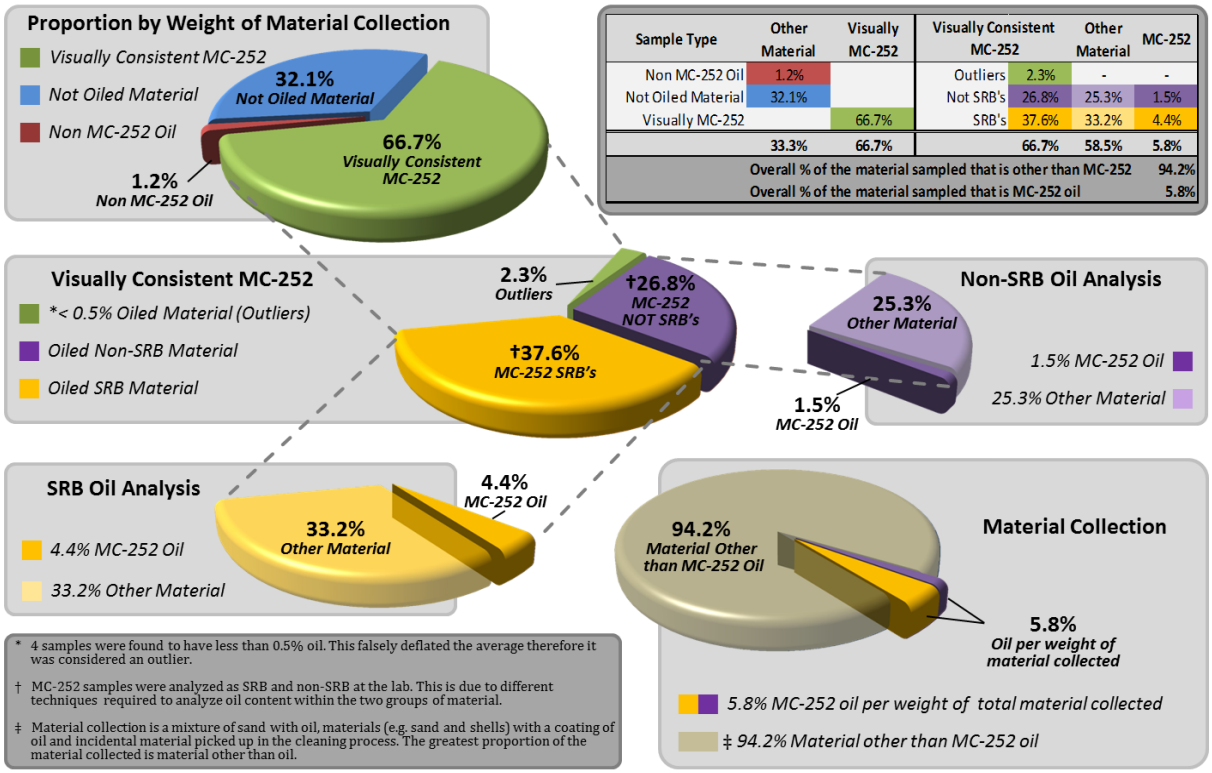
4 - Demonstrates how sample results would apply to the results as a whole

5 - Demonstrates the overall breakdown of material collection

Estimated proportions have an associated margin of error with 95% confidence. The errors are:

OTS %Oil: +/- 2%

TRB %Oil: +/- 1%



Sample Type	Other Material	Visually MC-252	Visually Consistent MC-252	Other Material	MC-252
Non MC-252 Oil	1.2%		Outliers	2.3%	-	-
Not Oiled Material	32.1%		Not SRB's	26.8%	25.3%	1.5%
Visually MC-252		66.7%	SRB's	37.6%	33.2%	4.4%
	33.3%	66.7%		66.7%	58.5%	5.8%
Overall % of the material sampled that is other than MC-252						94.2%
Overall % of the material sampled that is MC-252 oil						5.8%

* 4 samples were found to have less than 0.5% oil. This falsely deflated the average therefore it was considered an outlier.

† MC-252 samples were analyzed as SRB and non-SRB at the lab. This is due to different techniques required to analyze oil content within the two groups of material.

‡ Material collection is a mixture of sand with oil, materials (e.g. sand and shells) with a coating of oil and incidental material picked up in the cleaning process. The greatest proportion of the material collected is material other than oil.

LOOK AHEAD:

The results of the Material Segregation Project on Grand Isle, Louisiana in August 2013 have generated new ways of looking at material, especially non-MC252. Following the conclusion of this project, P&M crews began to identify all material that was visually consistent with MC252 versus material that was suspected as non-MC252. Operations log these data in their database after each P&M visit. As per normal protocol, all material collected during a P&M visit is recorded and reported as material collection. The identification of visually consistent and suspected non-MC252 does not change that procedure. Instead, it opens a door that allows planning and projects to be conducted which better inform the State of Louisiana, USCG, NOAA, and BP about the different material being collected during regularly scheduled P&M visits.

APPENDIX A: Segregated Material Report

Segregated Material
Report v4.xlsx

APPENDIX B: Example P&M Schedule – August

August P&M
Schedule - Louisiana (

Appendix II: Material Segregation Collection Data

Date Material Collected	Zone	ITZ or STZ	Original Weight (lbs)	Date of Segregation	Weight before segregation (grams)	Selected for segregation? (Y/N)	MC252 Weight (grams)	Other Weight (grams)	Suspected non-MC252 weight (grams)	Amount of time for segregation	Comments
8/1/2013	GI-12	ITZ	2.22	8/2/2013	1,007.0	Y	816.0	186.0	18.0	1.0	
8/1/2013	GI-11	ITZ	0.59	8/2/2013	290.0	Y	263.0	227.0	0.0	0.7	
8/2/2013	GI-13	ITZ	7.25								
8/2/2013	GI-13	STZ	0.04	8/23/2013	29.0	Y	23.0		6.0	0.1	
8/5/2013	GI-11	ITZ	0.81								
8/5/2013	GI-11	STZ	2.13								
8/5/2013	GI-12	ITZ	2.51								
8/5/2013	GI-13	ITZ	5.62	8/23/2013	2,610.0	Y	1574.0	828.0	88.0	2.0	random pick
8/5/2013	GI-14	ITZ	2.71	8/23/2013	1,245.0	Y	906.0	283.0	34.0	0.8	
8/6/2013	GI-11	ITZ	0.48	8/23/2013	224.0	Y	135.0	60.0	28.0	0.3	random pick
8/6/2013	GI-11	STZ	0.90								
8/6/2013	GI-12	ITZ	0.52								
8/6/2013	GI-13	ITZ	3.10								
8/6/2013	GI-13	STZ	0.08								
8/7/2013	GI-6	ITZ	0.04	8/23/2013	20.0	Y	11.0	2.0		0.2	
8/7/3013	GI-7	ITZ	0.41	8/23/2013	182.0	Y	170.0	12.0		0.3	
8/7/2013	GI-8	ITZ	0.90	8/23/2013	401.0	Y	374.0	20.0	8.0	0.8	
8/7/2013	GI-9	ITZ	0.15	8/23/2013	54.0	Y	45.0	7.0		0.0	
8/7/2013	GI-10	ITZ	0.11	8/23/2013	42.0	Y	18.0	5.0	28.0	0.1	
8/7/2013	GI-11	ITZ	0.15	8/23/2013	72.0	Y	56.0	16.0		0.1	random pick
8/7/2013	GI-12	ITZ	0.15	8/23/2013	78.0	Y	62.0	16.0		0.1	random pick
8/7/2013	GI-13	ITZ	1.14								
8/7/2013	GI-14	ITZ	2.86	8/23/2013	1,321.0	Y	841.0	367.0	56.0	0.8	
8/7/2013	GI-8	ITZ	0.92	8/23/2013	426.0	Y	398.0	20.0		0.5	
8/8/2013	GI-8	ITZ	0.59	8/23/2013	280.0	Y	219.0	27.0	33.0	0.6	
8/8/2013	GI-9	ITZ	0.13	8/23/2013	57.0	Y	51.0	7.0		0.1	
8/8/2013	GI-10	ITZ	0.04	8/23/2013	22.0	Y	16.0	6.0		0.1	
8/8/2013	GI-11	ITZ	0.08								
8/8/2013	GI-12	ITZ	0.17								
8/8/2013	GI-13	ITZ	0.35								
8/8/2013	GI-8	ITZ	0.24	8/23/2013	134.0	Y	121.0	11.0		0.3	
8/8/2013	GI-9	ITZ	0.07	8/23/2013	35.0	Y	31.0	6.0		0.1	
8/8/2013	GI-10	ITZ	0.04	8/23/2013	21.0	Y	18.0	8.0		0.1	
8/12/2013	GI-8	ITZ	0.48	8/29/2013	Group GI-8a						
8/12/2013	GI-9	ITZ	0.13								
8/12/2013	GI-11	ITZ	0.28								
8/12/2013	GI-12	ITZ	0.19								
8/12/2013	GI-13	ITZ	0.57								
8/13/2012	GI-4	ITZ	0.02								
8/13/2012	GI-7	ITZ	0.13								
8/13/2012	GI-11	ITZ	1.67								
8/13/2012	GI-12	ITZ	1.52								
8/13/2012	GI-13	ITZ	2.62								
8/13/2012	GI-14	ITZ	5.29	8/29/2013	Group GI-14c	Y					
8/14/2013	GI-10	ITZ	0.19	8/30/2013	Group GI-10b						
8/14/2013	GI-11	ITZ	0.85								
8/14/2013	GI-12	ITZ	0.24								
8/14/2013	GI-13	ITZ	0.61								
8/14/2013	GI-14	ITZ	1.80	8/29/2013	Group GI-14c	Y					
8/14/2013	GI-14	STR	0.79	8/29/2013	Group GI-14c	Y					
8/15/2013	GI-13	ITZ	0.48								
8/15/2013	GI-12	ITZ	0.17								
8/15/2013	GI-10	ITZ	0.39	8/30/2013	Group GI-10b						
8/15/2013	GI-11	ITZ	0.44								
8/15/2013	GI-9	ITZ	0.61								
8/15/2013	GI-8	ITZ	2.51	8/29/2013	Group GI-8a						
8/15/2013	GI-14	ITZ	4.73	8/29/2013	Group GI-14c	Y					
8/15/2013	GI-14	ITZ	2.49	8/29/2013	Group GI-14c	Y					
All bags	GI-14	Both	15.10	8/29/2013	6,939.0	Y	4652.0	1752.0	24.0	4.4	Group GI-14c
8/15/2013	GI-13	ITZ	4.16								
8/15/2013	GI-12	ITZ	3.92								
8/15/2013	GI-8	ITZ	0.97	8/29/2013	Group GI-8a						
8/19/2013	GI-8	ITZ	0.08	8/29/2013	Group GI-8a						
8/19/2013	GI-9	ITZ	0.06	8/30/2013	43.0	Y	43.0			0.0	
8/19/2013	GI-11	ITZ	0.11	8/30/2013	63.0	Y	63.0			0.0	random pick
8/19/2013	GI-12	ITZ	0.26								
8/19/2013	GI-13	ITZ	1.10								
8/19/2013	GI-14	ITZ	7.34	8/30/2013	Group GI-14a	Y					
8/19/2013	GI-14	ITZ	6.69	8/30/2013	Group GI-14a	Y					
8/19/2013	GI-14	STZ	0.52	8/30/2013	Group GI-14a	Y					
8/20/2013	GI-13	STZ	0.61								
8/20/2013	GI-13	ITZ	0.11								
8/20/2013	GI-12	ITZ	0.06								
8/20/2013	GI-11	ITZ	0.01								
8/20/2013	GI-7	ITZ	0.01	8/29/2013	9.0	Y	9.0			0.0	
8/20/2013	GI-13	STZ	2.24	8/30/2013	1,043.0	Y	764.0	214.0	7.0	1.0	random pick
8/20/2013	GI-13	ITZ	0.26								
8/21/2013	GI-11	STZ	0.03								
8/21/2013	GI-13	STZ	0.17	8/30/2013	95.0	Y	68.0	29.0		0.1	random pick
8/21/2013	GI-13	ITZ	0.11								
8/22/2013	GI-14	STZ	0.15	8/30/2013	Group GI-14a	Y					
8/22/2013	GI-14	ITZ	0.50	8/30/2013	Group GI-14a	Y					
8/22/2013	GI-13	STZ	0.17	8/30/2013	83.0	Y	83.0	66.0	19.0	0.1	random pick
8/22/2013	GI-13	ITZ	0.11								
8/22/2013	GI-12	ITZ	0.09	8/30/2013	46.0	Y	40.0	8.0		0.1	random pick
8/22/2013	GI-12	STZ	0.07								
8/22/2013	GI-11	STZ	0.05	8/30/2013	28.0	Y	28.0			0.0	random pick
8/22/2013	GI-11	ITZ	0.06								
8/22/2013	GI-8	STZ	0.04	8/29/2013	Group GI-8a						
8/22/2013	GI-8	ITZ	0.22	8/29/2013	Group GI-8a						
8/22/2013	GI-13	STZ	4.62								
8/22/2013	GI-13	STZ	3.72								
8/22/2013	GI-13	STZ	4.14								
8/22/2013	GI-14	ITZ	0.13	8/30/2013	Group GI-14a	Y					
All bags	GI-8	Both	0.34	8/29/2013	150.0	Y	142.0	9.0		0.2	Goup GI-8a
All bags	GI-14	Both	15.33	8/30/2013	6,778.0	Y	3961.0	2670.0	26.0	1.8	Group GI-14a

Date Material Collected	Zone	ITZ or STZ	Original Weight (lbs)		Date of Segregation	Weight before segregation (grams)	Selected for segregation? (Y/N)	MC252 Weight (grams)	Other Weight (grams)	Suspected non-MC252 weight (grams)	Amount of time for segregation	Comments
8/26/2013	GI-8	ITZ	0.06		8/30/2013	Group GI-8b						
8/26/2013	GI-10	ITZ	0.02		8/30/2013	Group GI-10b						
8/26/2013	GI-11	ITZ	0.13									
8/26/2013	GI-12	ITZ	0.19									
8/26/2013	GI-13	ITZ	1.69		8/30/2013	807.0	Y	569.0	188.0	6.0	1.0	random pick
8/26/2013	GI-14	ITZ	7.01		8/30/2013	Group GI-14b	Y					
8/26/2013	GI-14	STZ	0.17		8/30/2013	Group GI-14b	Y					
8/26/2013	GI-10	ITZ	0.22		8/30/2013	Group GI-10b						
8/26/2013	GI-8	ITZ	0.77		8/30/2013	Group GI-8b						
8/27/2013	GI-13	ITZ	0.17									
8/27/2013	GI-12	ITZ	0.08									
8/27/2013	GI-11	ITZ	0.11		8/30/2013	62.0	Y	58.0		7.0	0.2	random pick
8/27/2013	GI-6	ITZ	0.04		8/30/2013	31.0	Y	29.0	6.0		0.1	results for "after" pic are both bags
8/27/2013	GI-6	ITZ	0.03									
8/27/2013	GI-5	ITZ	0.02		8/30/2013	13.0	Y	13.0			0.0	date mislabeled on bag
8/27/2013	GI-4	ITZ	0.02		8/30/2013	14.0	Y	14.0			0.0	
8/27/2013	GI-3	ITZ	0.03		8/30/2013	14.0	Y	14.0			0.0	
8/27/2013	GI-13	ITZ	1.01									
8/27/2013	GI-12	ITZ	0.35		8/30/2013	195.0	Y	165.0	23.0		0.2	random pick
8/27/2013	GI-11	ITZ	0.37									
8/27/2013	GI-7	ITZ	0.11		8/30/2013	65.0		65.0			0.0	
8/28/2013	GI-8	ITZ	0.17		8/30/2013	Group GI-8b						
8/28/2013	GI-9	ITZ	0.08		8/30/2013	0.4	Y	36.0			0.0	
8/28/2013	GI-10	ITZ	0.05		8/30/2013	Group GI-10b						
8/28/2013	GI-11	ITZ	0.15		8/30/2013	0.8	Y	75.0	6.0		0.2	
8/28/2013	GI-12	ITZ	0.15									
8/28/2013	GI-13	ITZ	0.85									
8/28/2013	GI-13	STZ	0.30									
8/28/2013	GI-14	ITZ	4.01		8/30/2013	Group GI-14b						
8/28/2013	GI-14	STZ	0.11		8/30/2013	Group GI-14b						
8/28/2013	GI-8	ITZ	0.79		8/30/2013	Group GI-8b						
8/28/2013	GI-14	ITZ	1.49		8/30/2014	Group GI-14b						
8/28/2013	GI-13	ITZ	0.85									
8/29/2013	GI-11	ITZ	0.70									
8/29/2013	GI-12	ITZ	1.58									
8/29/2013	GI-13	ITZ	2.29									
8/29/2013	GI-14	ITZ	1.74		8/30/2013	Group GI-14b						
8/29/2013	GI-11	ITZ	0.11									
8/29/2013	GI-12	ITZ	0.17									
8/29/2013	GI-12	STZ	0.04		8/30/2013	16.0	Y	14.0			0.1	random pick
8/29/2013	GI-14	ITZ	2.60		8/30/2013	Group GI-14b						
8/29/2013	GI-8	ITZ	1.45		8/30/2013	Group GI-8b						
All bags	GI-8	ITZ	3.24		8/30/2013	1,530.0	Y	1367.0	116.0	6.0	0.5	Group GI-8b
All bags	GI-10	ITZ	0.29		8/30/2013	130.0	Y	112.0	15.0	10.0	0.2	Group GI-10b
All bags	GI-14	Both	17.13		8/30/2013	7,996.0	Y	3845.0	3559.0	11.0	2.0	Group GI-14b

Appendix III: OTS Matrix Results

% OTS OIL Weight

Anaylsis is on percent oil with OTS (other than SRB) material

No outliers have been removed

Confidence Level	95.0%

Overall	**N**	**Mean**	**St Dev**	**SE Mean**	**LCI**	**UCI**	**e**
%MC252	47	0.0545	0.0629	0.0092	0.0360	0.0730	0.0185

%MC252 By Zone	**N**	**Mean**	**St Dev**	**SE Mean**	**LCI**	**UCI**	**e**
GI-6	2	0.1275	0.1776	0.1255	-1.4678	1.7227	1.5952
GI-7	2	0.0465	0.0638	0.0451	-0.5264	0.6194	0.5729
GI-8	9	0.0398	0.0111	0.0037	0.0312	0.0484	0.0086
GI-9	4	0.1100	0.1070	0.0535	-0.0603	0.2802	0.1703
GI-10	6	0.0819	0.1185	0.0484	-0.0425	0.2063	0.1244
GI-11	6	0.0331	0.0133	0.0054	0.0192	0.0470	0.0139
GI-12	6	0.0319	0.0146	0.0059	0.0166	0.0472	0.0153
GI-13	8	0.0505	0.0126	0.0045	0.0399	0.0610	0.0105
GI-14	4	0.0323	0.0101	0.0051	0.0162	0.0483	0.0161

%MC252 By Segment	**N**	**Mean**	**St Dev**	**SE Mean**	**LCI**	**UCI**	**e**
LAJF01-009-10	4	0.0870	0.1185	0.0593	-0.1016	0.2756	0.1886
LAJF01-010-10	12	0.0575	0.0844	0.0244	0.0039	0.1111	0.0536
LAJF01-010-15	11	0.0410	0.0227	0.0068	0.0258	0.0562	0.0152
LAJF01-011-10	20	0.0397	0.0156	0.0035	0.0324	0.0470	0.0073
LAJF01-016-10	12	0.0444	0.0145	0.0042	0.0352	0.0536	0.0092
LAJF01-016-30	4	0.0323	0.0101	0.0051	0.0162	0.0483	0.0161

Zone	% OIL OTS
GI-10	0.8%
GI-10	31.6%
GI-10	7.7%
GI-10	6.7%
GI-10	1.5%
GI-10	0.9%
GI-11	1.6%
GI-11	1.9%
GI-11	3.7%
GI-11	3.5%
GI-11	4.2%
GI-11	5.0%
GI-12	3.7%
GI-12	3.1%
GI-12	0.4%
GI-12	3.5%
GI-12	4.5%
GI-12	4.0%
GI-13	4.7%
GI-13	3.0%
GI-13	4.8%
GI-13	5.0%
GI-13	4.2%
GI-13	5.3%
GI-13	6.5%
GI-13	6.9%
GI-14	3.0%
GI-14	2.0%
GI-14	4.3%
GI-14	3.6%
GI-6	25.3%
GI-6	0.2%
GI-7	9.2%
GI-7	0.1%
GI-8	3.8%
GI-8	3.2%
GI-8	5.0%
GI-8	5.2%
GI-8	5.1%
GI-8	1.7%
GI-8	4.2%
GI-8	3.3%
GI-8	4.4%
GI-9	24.3%
GI-9	15.0%
GI-9	3.5%
GI-9	1.2%

Appendix IV: TRB Matrix Results

% TRB OIL Weight

Anaylsis of %Oil in TRB Samples (SRB material)

5 Outliers have been removed from analysis

- 96% at GI-10 - Confirmed non-MC252. Removed from dataset
- 0.13%, 0.07%, 0.01%, and 0.45% - ~5σ above the mean. Falsly deflates %Oiling.

Confidence Level	95.0%

Overall	**N**	**Mean**	**St Dev**	**SE Mean**	**LCI**	**UCI**	**e**
%MC252	66	0.1163	0.0242	0.0030	0.1104	0.1223	0.0060

%MC252 By Zone	**N**	**Mean**	**St Dev**	**SE Mean**	**LCI**	**UCI**	**e**
GI-3	1	0.1200					
GI-4	2	0.1058	0.0003	0.0002	0.1027	0.1089	0.0031
GI-5	1	0.0825					
GI-6	2	0.1302	0.0131	0.0093	0.0123	0.2481	0.1179
GI-7	3	0.1215	0.0173	0.0100	0.0784	0.1645	0.0430
GI-8	10	0.1260	0.0248	0.0079	0.1082	0.1438	0.0178
GI-9	9	0.1203	0.0383	0.0128	0.0908	0.1497	0.0294
GI-10	6	0.1157	0.0134	0.0055	0.1017	0.1298	0.0141
GI-11	10	0.1108	0.0168	0.0053	0.0988	0.1229	0.0120
GI-12	8	0.1161	0.0267	0.0094	0.0938	0.1384	0.0223
GI-13	10	0.1179	0.0243	0.0077	0.1005	0.1353	0.0174
GI-14	4	0.0966	0.0227	0.0113	0.0605	0.1327	0.0361

%MC252 By Segment	**N**	**Mean**	**St Dev**	**SE Mean**	**LCI**	**UCI**	**e**
LAJF01-005-10	4	0.1035	0.0155	0.0078	0.0788	0.1282	0.0247
LAJF01-009-10	6	0.1179	0.0217	0.0089	0.0951	0.1407	0.0228
LAJF01-010-10	16	0.1127	0.0154	0.0038	0.1045	0.1208	0.0082
LAJF01-010-15	13	0.1250	0.0227	0.0063	0.1112	0.1387	0.0137
LAJF01-011-10	28	0.1148	0.0220	0.0042	0.1063	0.1234	0.0085
LAJF01-016-10	14	0.1118	0.0250	0.0067	0.0973	0.1263	0.0145
LAJF01-016-30	4	0.0966	0.0227	0.0113	0.0605	0.1327	0.0361

Zone	% OIL TRB
GI-10	10.5%
GI-10	11.8%
GI-10	9.6%
GI-10	11.6%
GI-10	12.8%
GI-10	13.2%
GI-11	12.8%
GI-11	11.2%
GI-11	13.9%
GI-11	8.8%
GI-11	11.6%
GI-11	10.9%
GI-11	10.9%
GI-11	8.3%
GI-11	10.3%
GI-11	12.1%
GI-12	10.6%
GI-12	16.3%
GI-12	14.5%
GI-12	11.8%
GI-12	9.8%
GI-12	8.4%
GI-12	12.2%
GI-12	9.3%
GI-13	8.7%
GI-13	8.6%
GI-13	14.1%
GI-13	15.0%
GI-13	13.0%
GI-13	8.4%
GI-13	11.2%
GI-13	12.7%
GI-13	13.0%
GI-13	13.1%
GI-14	8.5%
GI-14	8.4%
GI-14	13.1%
GI-14	8.7%
GI-3	12.0%
GI-4	10.6%
GI-4	10.6%
GI-5	8.3%
GI-6	12.1%
GI-6	13.9%
GI-7	14.1%
GI-7	10.7%
GI-7	11.7%
GI-8	12.2%
GI-8	9.5%
GI-8	16.2%
GI-8	14.4%

GI-8	13.3%
GI-8	8.9%
GI-8	13.5%
GI-8	12.9%
GI-8	15.3%
GI-8	10.0%
GI-9	13.2%
GI-9	10.9%
GI-9	9.4%
GI-9	7.3%
GI-9	11.2%
GI-9	20.5%
GI-9	13.0%
GI-9	9.0%
GI-9	13.8%