

- 44 5. Significant benefits would flow from engaging effectively with stakeholders at this stage
45 to define technical details of the scope of the study within the broad bounds required
46 within SB 546;
47
- 48 6. Only once the scope has been fully understood and clear objectives established will it be
49 possible to select the LCAn contractors (or teams of contractors) able to complete the
50 study. To commit to the LCAn contractor(s) at this stage, before the study is fully
51 defined and understood, imposes constraints that could adversely affect the outcome,
52 preventing the achievement of the requirements of the legislation. UOTF propose that a
53 range of potential contractors be included as stakeholders in the process to develop and
54 define the project objectives;
55
- 56 7. It is essential that the study builds on as wide a range of independent expertise as
57 possible. UOTF do not believe that the development, execution and review of the used
58 oil study can satisfactorily be completed with the reliance proposed on contractors strictly
59 within the University of California system. In our view the necessary breadth of
60 experience and knowledge does not reside in single institutions and, as a minimum,
61 partnerships and/or, sub-contractors outside of the California university system will be
62 necessary.
63

64 API are ready and willing to contribute to the process of development of the study aims and
65 objectives and to join with other stakeholders in the process of defining details of the life cycle
66 analysis study to aid CalRecycle in selecting the most appropriate team of LCAn contractors and
67 peer reviewers to make this project the success it deserves to be. While API believes that it is
68 premature to select the LCAn contractor(s) and peer reviewers, it is, on the other hand,
69 absolutely timely to select the stakeholder facilitator contractor now.
70

71 INTRODUCTION

72

73 API's Used Oil Task Force (UOTF)¹ has considerable expertise in the successful management of
74 used automotive and industrial oils and believes that the management of these resources should
75 be optimized, wherever possible, to protect the environment, maximize economic utility and to
76 prevent, as far as possible, illegal and inappropriate disposal or use of used oil. Used oil
77 management/regulatory systems should be practical, effective, responsive and robust in the face
78 of changing demands from suppliers and users.
79

80 API's UOTF wish to be active participants with CalRecycle to address the requirements of
81 SB546 and to develop and implement a sound policy for used oil.
82
83
84

¹ The 25 members of the UOTF represent organizations that develop and produce lubricant additives, lubricants, re-refine base oils as well as collectors and processors of used oil. The organizations include: Afton, BP, Chevron, ConocoPhillips, ExxonMobil, ILMA, Infinium, Lubrizol, NORA, Petro-Canada/Suncor, Satefy-Kleen, Shell and Valvoline.

85 MANAGEMENT OF USED OIL

86

87 Problem definition

88

89 Designing, developing and implementing the most effective and environmentally beneficial
 90 mechanism for management of used oil requires a thorough appreciation of a complex system.
 91 Some of the key issues that must be considered are mentioned below. Success will only be
 92 achieved by taking account of the specific nature of the used oil market and environmental and
 93 economic conditions in the jurisdiction of interest.

94

95 Multiple sources and varying composition

96

97 A wide range of specialist lubricating and industrial oils are available to serve a very wide
 98 spectrum of purposes in industry and the automotive sectors. The quantity and nature of these
 99 materials can vary over time and certainly from customer to customer. Used oil varies
 100 considerably in composition, due to the mix of products in use, the service requirements and the
 101 contaminants that are accumulated in use.

102

103 Significant value

104

105 Used oil has significant value to various customers and can be seen as a valuable product –
 106 typically this has been most obvious where used oil is used as a fuel (the use of processed or
 107 unprocessed used oil as a fuel is common in many US states and other countries). Used oil has
 108 also been in demand as feedstock for re-refining in parts of Europe in recent years leading to a
 109 significant value to collectors of used oil.

110

111 Environmental impacts

112

113 It is generally accepted that the main adverse environmental impact of used oil arises through
 114 failure to collect and manage it. This can result in inappropriate uses or simple dumping of the
 115 used oil – the impact on marine and aquatic toxicity is the most obvious². It follows therefore,
 116 that the most important feature of a comprehensive used oil management system is to ensure that
 117 collection rates are maximized. There are several examples where ineffective used oil
 118 management systems and inappropriate disposal of used oil have led to significant environmental
 119 harm. Ironically, experience of jurisdictions, mainly in Europe, have shown that a singular focus
 120 on used oil disposition (e.g. re-refining or combustion) in a regulatory regime can have the
 121 unintended consequence of reducing collection rates and, thus, increasing improper disposal
 122 rates. This can be the result of suppressing the demand for used oil by limiting its outlets, such
 123 as we understand was done in Italy. Suppressed demand will inevitably lead to reduced supply
 124 (meaning lower collection rates, as data indicate Italy experienced relative to its European Union
 125 peers).

126

127 The life cycle analysis study should be suitable to optimize choice of policy and regulatory
 128 mechanisms that achieve the best overall environmental outcome when considering the entire
 129 system.

² for example - <http://www.scientificamerican.com/article.cfm?id=how-to-keep-waste-oil-out>

130 **Achieving the best overall environmental outcome**

131
 132 Systems that manage used oil are complex and the LCA must assess the integrated and dynamic
 133 nature of the used oil market, collection and processing and the multiple competitive markets and
 134 the full impacts of different means of handling and converting used oil into products, as well as
 135 the regulatory regime (e.g. subsidies for certain dispositions and so on). In the course of seeking
 136 simple answers, simplified studies were often used that resulted in comparisons of a few end uses
 137 for used oil – in a sense forcing a false choice between two options and taking no account of the
 138 context and knock-on impacts of the system from oil production through to delivery of utility to
 139 customers.

140
 141 UOTF believe that the end goal should be putting in place a system that consistently delivers the
 142 best overall environmental outcome when considering the system as a whole.

143
 144 **Changing circumstances**

145
 146 UOTF argue that the development of a useful model to optimize the management of used oil is
 147 far more involved than conducting a life cycle assessment of different used oil disposition (end-
 148 use) options (however detailed). A *comprehensive* life cycle analysis will require building up a
 149 robust and detailed model that can take into account a wide range of impacts and be responsive
 150 to (for example):

- 151
 152 • changing input parameters – amounts, types and sources of used oil;
 153 • behavior of used oil holders and producers (and effects of regulatory or other incentives
 154 designed to change behavior)
 155 • processing options – re-refining processes, processing for use as a fuel, and other uses;
 156 • market dynamics – costs and value of products, wastes, liabilities;
 157 • handling and disposition requirements for wastes and by-products;
 158 • geographical effects – processing and use of products remote from source (eg shipping
 159 product out of state).
 160 • regulatory structure

161
 162 While it is possible to develop a life cycle assessment to compare a few scenarios, what is
 163 needed is a model that can be used to evaluate options in a changing world. It must help policy
 164 makers to determine what can be most effective, where the weak points in the overall
 165 management system are, and what the real impacts of policies and interventions are and will be.
 166 Such a model could be applied by various agencies, would be responsive to changes in data or
 167 development of new processes, and could be updated with new and improved data over time.

168
 169 API would propose that the development of such a model would be the first phase to engage a
 170 wide group of stakeholders to build the assessment framework. It is important to secure the
 171 input and participation of knowledgeable stakeholders and experts in phase one, including
 172 potential LCA study contractors to the extent permissible under state law. The second phase
 173 would be to begin the application of the model to various scenarios to assist with the
 174 development of potential policy options, as required in SB 546.

175

176 A description of this approach is appended as a "Used Oil Life Cycle Evaluation Outline," see
177 Annex A

178
179 **Special interests and conflicts**

180
181 Naturally some organizations would come to such a study with preconceived notions of the
182 outcome or interests in achieving a particular outcome. With used oil the debate has often
183 descended to a narrow comparison of a stark choice between final uses for used oil and
184 significant concerns have been raised over many of the previous studies in this area. We
185 strongly agree with CalRecycle that avoidance of any real or perceived conflicts of interest, be
186 they based on previously drawn conclusions or direct financial or intellectual interests in
187 particular findings of the work, must be a priority.

188
189 Clearly it is appropriate that all interests are represented amongst stakeholders and that
190 contractors and those controlling the work product are independent of special interests or
191 conflicts.

192
193 **Separation of model development and model application**

194
195 UOTF appreciate and support CalRecycle's determination to achieve full and constructive
196 stakeholder input to the used oil evaluation study. It is important, as noted by CalRecycle, that
197 preconceived solutions and premature conclusions need to be carefully avoided so that the study
198 can meet the needs of CalRecycle and the intent of SB 546. Since many stakeholders have
199 particular interests and some will have a pre-conceived notion of the conclusions (or what the
200 conclusions should be) UOTF propose that a clear separation be maintained between the
201 development of a model and the application of a model.

202
203 A model can be developed that can be used to assess the environmental impacts, costs,
204 effectiveness (against chosen measures) and can, with careful planning and diligent
205 implementation, be robust, flexible and should have wide stakeholder agreement.

206
207 Such a model should be available for scrutiny (i.e., transparent) and flexible so that it can be
208 modified, for example:

- 209
210
 - When new data on existing processes become available;
 - When new processes are developed;
 - When a user has additional constraints or policy requirements to meet.

211
212
213
214 Conceived in this way the model can be seen as a resource that can be used by CalRecycle and
215 the Legislature to adapt California's used oil recycling program to evolving market dynamics,
216 thereby yielding far greater value for money than something that has a one-off application.

217
218 The application and selection of specific model parameters for chosen scenarios can then be
219 carried out in discussion with stakeholders, recognizing that there will be strongly held
220 differences of opinion on the most appropriate scenario choices. The strength of this approach
221 would be that while there may be quite respectable differences of opinion about the most

222 appropriate scenarios to be evaluated, used oil treatment and use options to be included and cost
223 constraints to apply, the base model is well-founded and would have wide stakeholder support.
224 One can envisage a situation where interested stakeholders, could run the model to evaluate
225 scenarios of their choosing.

226
227 **Geographical scope**

228
229 It is widely recognized that the management of used oil has local, regional and global impacts³,
230 this suggests that developing the favored solution to used oil management should reflect this.

231
232 It is clear and appropriate that the priority of the used oil evaluation study is to provide
233 information directly relevant to addressing the management of used oil produced in California.
234 However, as discussed, many used oil issues have relevance across borders and at various scales.

235
236 It may be appropriate to consider smaller geographical areas than California – for example, if
237 there are areas that are remote from processing centers – such that there’s a legitimate interest in
238 examining the most appropriate systems for used oil management.

239
240 There is also a clear need for other jurisdictions to develop and implement effective used oil
241 management systems. All countries generate used oil and require effective systems to manage it
242 appropriately. Other states in the US and other countries could benefit from being able to
243 develop and apply a model that is robust and flexible building on a sound conceptual framework.

244
245 A well thought through model could have wide application – a flexible core evaluation
246 mechanism could be adapted, for example by adding in specific data on sources and composition
247 of used oil, locally relevant cost and collection information as well as actual and potential
248 treatment and use modules.

249
250 The real beauty of such an approach is that the flexibility built in means a model can be applied
251 now to many geographical and policy environments but more importantly for California the
252 model can be used in the future to ensure that policy keeps pace with and responds to changes in
253 local circumstances – for example changes in used oil quantity and composition, economic
254 changes and availability of additional treatment and reuse options for used oil.

255
256 **EEA and waste management models**

257
258 We promised to provide some information on examples of studies that had gone further than
259 simple binary comparative life cycle assessments.

260
261 Eco-efficiency assessments (EEA) are one means to bring in a consideration of costs.
262 Considerable work has been done to develop mechanisms to make results from life-cycle
263 thinking directly relevant to policy making. One concept is eco-efficiency – the World Business
264 Council for Sustainable Development (WBCSD) coined the term in 1991 and described the
265 concept as follows:

266

³ see for example Boughton and Horvath, Environmental Science and Technology, 38, 2004

267 *“in short it [eco efficiency] is about creating more value with less impact”*

268

269 In eco-efficiency studies a set of scenarios may be compared using life-cycle assessment
270 methods and indicators derived for each scenario to show “environmental performance”. These
271 are then overlaid with a cost comparison. Both the environmental and cost assessments need to
272 cover the *entire* life-cycle (no simplifications) to ensure that the impacts and costs being
273 considered are representative.

274

275 In concept, the idea of modeling the used oil system using life-cycle assessment tools for
276 elucidating the environmental performance of different scenarios and combining this with an
277 economic assessment has similarities to EEA studies⁴. Of course, the model becomes more
278 powerful in applications where a series of iterative steps can be combined to test the effects of
279 user-defined changes or constraints – for example, examining linkage between value/cost of used
280 oil for the producer and the amount of material that is available for collection.

281

282 Another useful example to consider is the model for waste management decision-makers that
283 was developed for the UK Environment Agency. The Waste Resources Assessment Tool for the
284 Environment (WRATE) was designed to be a common assessment framework for diverse waste
285 management policy makers – typically in local Government who had to evaluate and select
286 effective waste management systems. Each area would have different constraints (existing
287 infrastructure, population density, logistical concerns, treatment infrastructure) and the model
288 needed to be flexible enough to cope with this as well as test the effect of anticipated changes in
289 future. The central model was developed with significant stakeholder input and thorough
290 review.

291

292 A user constructs a scenario or series of scenarios selecting from default modules (eg waste
293 collection vehicles and treatment options) or inputting user-specified data. The system has basic
294 checking to ensure that all inputs are treated and disposed of with regulatory and other
295 constraints respected. Not only does the model provide an environmental profile but also a cost
296 profile to the user.

297

298 The user can then optimize the system to meet their needs adjusting flows and constraints as
299 needed and can test sensitivities of the system (eg what if the waste flows reduced, what if
300 greater diversion was achieved, what if a thermal treatment or new recycling facility were
301 installed at various scales and in differing locations).

302

303 **Comments on Scopes of Work**

304

305 In the sections that follow we provide some few specific comments on the documents provided
306 by CalRecycle for the 11 August 2010 meeting of the Materials Management and Local
307 Assistance Program. Also, many more detailed suggestions on those documents are appended
308 with the suggestions highlighted in Track Changes format.

309

310 The three scope of work (SOW) documents lay out the requirements for three contractors to
311 assist CalRecycle staff to develop the LCA and provide a report to the legislature.

⁴ three example documents relating to aspects of EEA are included/referenced in Annexes D, E and F

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Attachment A – Facilitator SOW, Contract to Facilitate Stakeholder Process and Legislative Report for Used Oil Life-Cycle Assessment Project

UOTF suggests that a facilitator should be appointed as soon as possible in order to begin the process of gathering stakeholder input and developing the scope of work for the used oil evaluation. Throughout the term life cycle analysis (LCAn) should be used to convey the fact that what is required is a comprehensive analysis rather than a narrow binary comparison study.

UOTF is concerned that description for the contractor for this part of the work does not cite any experience of the issues or process under consideration. Ensuring the most effective delivery of this study will require not only efficient management of stakeholder input, but also the ability to assist in the winnowing out of the less relevant or less valuable information so that the highest quality input is used.

In the description of task 3a.i there is a bullet setting out information that the report must contain:

“All background data required for the LCA study agreed upon and submitted by the participating stakeholders (background data could include numbers, facts, figures, reports, etc)”

This seems to imply that the entirety of the information to be used in this study is expected to be gathered by the stakeholders and collected by the facilitator. API respectfully suggest that this would be an inappropriate expectation, not only implying as it does that all relevant data already exist, but that this process would be adequate, in a short period, to provide the material needed for a study that is apparently to be designed over the same, short period by the stakeholders.

The description of Task 3a.ii, appears to state that no account will be taken of feedback received at the fourth stakeholder meeting. Is that the intention?

The SOW title appears to imply a greater input from the contractor in the compilation of a report to the legislature than is described in Task 4.

Attachment B – Practitioner SOW, Scope of Work Used Oil Life-cycle Assessment Study

This SOW is understood to be designed to describe the work of the main contractor for the comprehensive life cycle analysis of used oil management. As such it is the most important and involved part of the overall program and will require application of a wide range of skills and experience.

Since the detailed objectives and the scope of the project have yet to be defined, API believe that it is premature to select this contractor. API’s expectation remains that to meet the requirements of SB 546, and to deliver an effective and high quality product reflecting the significance of the issues, the complexity of the systems and the large resources that are available to complete the work, a process of project definition and subsequent selection of a contractor or, more likely, team of contractors, would need to be carried out over a period of one or more months and with

358 significant stakeholder input (in particular on the scope definition)⁵. Not only is there a real risk
359 that a single, pre-determined, contractor could lack skills and experience in important aspects of
360 the work, but their pre-selection may bias the development of the study and, perhaps as
361 importantly, be seen, with hindsight, to be a deficiency.

362
363 Task 1a.i suggests that the contractor is expected to be able to provide a project plan by October
364 2010 – well ahead of any definition of the study that is required.

365
366 Task 1.c – the identification of data needs and gaps is very important and API are pleased to see
367 this explicitly mentioned. However, again, it is not clear how most of this will be carried out
368 ahead of the definition of the study (unless the contractor already has a preconceived position
369 that we are unaware of).

370
371 Task 2a – API believe that it is certain that additional data will be required. It is likely, in fact,
372 that data will need to be generated to fill important gaps identified in the study (either absence of
373 data, or data of insufficient quality or relevance). Therefore, this task will require significantly
374 more attention and probably input from a range of players (ie not a single contractor).

375
376 No provision appears to be made explicit for data quality review and data quality assurance.

377
378 Task 2b – Conduct life-cycle analysis study. This task is the substance of the entire effort and
379 includes only the briefest description. The time frame implies that the work will be completed in
380 around 10 months. API experience would suggest this to be a very short timeframe.

381
382 Interaction with stakeholders during the Phase II appears to be minimal, API suggest that a much
383 more interactive approach will be required.

384
385 Task 3b –LCAn study reporting and presentation

386
387 Task 3b.i Draft LCAn study report and presentation. The draft report is to include
388 “*interpretation*” of the results. As things stand at present we do not know what the results are to
389 be used for, we do not see a clear understanding expressed of the objectives of the work and we
390 wonder what interpretation is intended.

391
392 The draft report is due in September 2011 – a very short period from the start of the work.

393
394 Section IV - Contract/Task Time Frame – is the completion due in September 2012?

395
396 Comments marked as “tracked changes” are included in Annex B to this paper. Since this
397 element of the work is fundamental to the completion of the life cycle analysis UOTF believe
398 that further work will be needed to fully define the scope of the task.

399
400
401
402

⁵ contractor selection would need to proceed according to the rules established by the State of California

403 **Attachment C – Peer Review SOW, Independent Peer Review of Used Oil Life-Cycle**
404 **Assessment Study**

405
406 The establishment of a strong peer review function is important in ensuring the success of the
407 LCAAn.

408
409 The peer review needs to be clearly and functionally independent of the interests of the LCAAn
410 practitioners and others involved in the execution of the study. They should be able to
411 demonstrate or draw upon suitable expertise – technical knowledge of used oil systems,
412 development and implementation of models that draw on life-cycle techniques, economic
413 expertise, application of models etc.

414
415 It is important to set clear objectives that describe the requirements of the overall project so that
416 the objectives for the peer review could be set accordingly.

417
418 It will be important to maintain appropriate distance between those charged with developing and
419 implementing the project and the peer review team to avoid the danger of losing the independent
420 view point.

421
422 As with the other SOWs it seems to be premature to select contractors well before the full,
423 detailed scope and nature of the work to be done has been decided.

424
425 API supports the proposal to ensure that the panel provide relevant expertise. In seeking
426 expertise on this subject matter it is important to recognize that the scope of the project is much
427 wider and more involved than simply “*re-refining and/or crude oil refining*”. Further UOTF
428 believe that the review function should include private or non-Governmental entities from the
429 outset.

430
431 API would appreciate a chance (as may other stakeholders) to reflect on the range of expertise
432 that might be sought for a peer review panel, preferably in the light of a clear view on the nature
433 and fully defined scope of the study.

434
435 Comments on possible wording of the SOW are included in Annex C.
436

1 **Annex A – Used Oil Evaluation Framework**

2

[Please see separate file.](#)

4

5

Annex B – SOW Practitioner

Attachment B – Practitioner SOW - 1 - Department of Resources Recycling & Recovery

SCOPE OF WORK

Used Oil Life-~~c~~ycle ~~Assessment~~-analysis (LCAn) Study

I. INTRODUCTION/OBJECTIVES

As part of Senate Bill 546 of 2009, CalRecycle was directed to 1) "~~C~~ontract with a third-party consultant with recognized expertise in life cycle assessments to coordinate and conduct a comprehensive life-cycle assessment (LCA) analysis of the used lubricating and industrial oil management process, from generation through collection, transportation, and re-use alternatives"; 2) solicit broad stakeholder input on all aspects of the LCA life cycle analysis; 3) evaluate the impacts of certain components of SB 546; and 4) submit a report to the Legislature on the results and "any recommendations for statutory changes that may be necessary to promote increased collection and responsible management of used oil." CalRecycle staff will implement a phased approach to this project. The initial series of facilitated stakeholder and workgroup meetings that will culminate in the development of the scope and design of the model to be used in the life cycle analysis (LCAn) LCA study are collectively referred to as Phase I. Phase I participants include the CalRecycle project team, ~~A~~Department of Toxic Substances Control (DTSC) representative(s) project team, Expert Facilitator, LCA-Life cycle analysis Practitioner, LCA Peer Review contractor, and a broad and diverse stakeholder group. During Phase IIa, the LCA-Life cycle analysis practitioner (Contractor) will build the model to meet the objectives derived during Phase I with the aim of achieving wide stakeholder buy-in to the model design and construction. In Phase IIb the practitioner will coordinate use of the model from Phase II in the develop and conduct of the LCALCAN study and subsequent LCALCAN study report; the draft and final of which will be reviewed by and commented on by the stakeholder group. Throughout Phases I and II, the LCAn -and by the Peer Review Contractor will monitor and provide comments on the processes employed. Phases I, ~~and~~ IIa and IIb will provide CalRecycle with the materials necessary to develop the aforementioned Legislative report. There will be three contractors assigned to this project:

1. Expert Facilitator
2. LCA-LCAn Practitioner
3. LCALCAN Peer Review Contractor

This contract represents the duties of the LCA-LCAn Practitioner Contractor, above, and supports the successful completion of the LCALCAN project by performing the life-cycle assessment analysis study for ultimate inclusion in the CalRecycle Legislative report.

II. WORK TO BE PERFORMED

The Contractor will participate as needed in discussions between the CalRecycle project team, ~~A~~DTSC representative project team, the independent LCALCAN Peer Review contractor, and the Expert Facilitator contractor to ensure that the LCA life cycle analysis study is conducted in the most efficient and effective manner. The Contractor ~~will~~ will likely participate in selected Phase I stakeholder meetings and subgroup meetings, as appropriate as

Annex B – SOW Practitioner

determined by the CalRecycle Contract Manager in coordination with the CalRecycle/DTSC project team, for the purpose-s of ~~assisting-utilizing input from~~ the stakeholder group to A) define the "technical" details of the scope of the life cycle analysis study that is broadly defined in SB 546, B) develop the robust model necessary to evaluate environmental and resource impacts of potentially applicable general regulatory, marketplace, disposition alternative, and technical scenarios, and C) identify and produce the appropriate data necessary for completion of a broad application of that model to California focused scenarios ~~Attachment B – Practitioner SOW – 2 –~~

~~of within~~ the LCALCAN study. Phase I will ~~culminate in~~include a report prepared by the Expert Facilitator contractor that summarizes the scope and design of the LCALCAN-study, as determined with the input ofby the stakeholder group within the broad definition in SB 546, as well as the robust model, the development of which will be coordinated by the Contractor, plus any background data supplied by the stakeholder group. The Contractor will use this report as the basis for constructing and applying the model and coordinating conduct ~~of~~ing the LCALCAN study during Phase II of the project.

The model developed for analysis of the used oil system should be flexible, transparent and adaptable so that it can be used for application to varying regulatory and other scenarios into the future. It should be available for scrutiny by and application by a range of parties and set up so that new data can be used to develop additional modules (to respond to changes in technology etc) and to be tailored to specific local circumstances and constraints.

III. TASKS IDENTIFIED

All written deliverables are subject to the Contract Manager's written approval.

Task 1. Provide Technical Assistance to CalRecycle.

Task 1a. Project coordination.

Task 1a.i. Prepare work plan. The Contractor will convene with the Contract Manager, the CalRecycle/~~DTSC~~ project team, and the Expert Facilitator, ~~and the LCA Peer Review contractor~~ to discuss the project objectives, budget, timelines, and implementation of tasks, activities, and deliverables. The Contractor will develop a detailed work plan, subject to approval of the Contract Manager, following this meeting.

Deliverables: Work plan.

Timeline: This deliverable is expected to be completed by ~~October-December~~ 2010.

Task 1a.ii. Convene with project team. The Contractor will participate as needed in discussions ~~between~~among the Contract Manager, CalRecycle/~~DTSC~~ project team, and the Expert Facilitator, ~~and the LCA Peer Review contractor~~ to ensure that the LCAlife cycle analysis-study is conducted in the most efficient and effective manner. At a minimum, the Contractor will convene with the Contract Manager and the CalRecycle/~~DTSC~~ project team after each stakeholder meeting and LCALCAN-study milestone.

Deliverables: A minimum of six 2-hour touch-base meetings with CalRecycle/~~DTSC~~ project team and other project contractors.

Timeline: These deliverables are expected to be completed by the CalRecycle public meeting (approximately April 2012).

Task 1b. Participate in stakeholder meetings. Due to the fact that a stakeholder group will be guiding the scope and design of the LCAlife cycle analysis study within the broad guidelines of SB 546, the Contractor will attend and participate in appropriate stakeholder meetings and conference calls as determined by the Contractor and CalRecycle/~~DTSC~~ project team. It is estimated that this includes up to 4 stakeholder and/or public meetings (as

Annex B – SOW Practitioner

described in the table below) and up to 6 subgroup conference calls during Phase I and one or more stakeholder meetings and one CalRecycle public meeting in Phase II as detailed below:

Stakeholder meeting	Estimated date	Purpose
#1	Sept/Oct <u>Nov/Dec</u> 2010	Explain process, introduce project team & contractors, background presentations, define subgroups, assign tasks, etc.
#2	Jan/Feb 2011	Stakeholders present draft recommendations; refine data/recommendations.
#3	Mar/Apr 2011	Expert Facilitator Contractor presents draft Stakeholder Recommendations Report, receives feedback.
#4	May 2011	Expert Facilitator Contractor presents final Stakeholder Project Recommendations report (no input on report; report-out to interested parties).
<u>#4a</u> <u>(Phase I)</u>	<u>July 2011</u>	<u>Life cycle analysis Practitioner presents robust model to be used in Phase II</u>
#5 (Phase II)	October 2011	LCA-LCA n Practitioner presents Draft LCA <u>LCA</u> n study report and findings (i.e. identifies what might be missing, needs for refinement, recommends further data needs).
CalRecycle Public Meeting	April 2012	CalRecycle gathers feedback on final LCA <u>LCA</u> n study report. Feedback will be included in CalRecycle's report to the Legislature.

Annex B – SOW Practitioner

Deliverables: Attend and participate in up to 6 stakeholder and/or public meetings and up to 6 subgroup conference calls.

Timeline: The stakeholder meetings are expected to be completed by October 2011. The CalRecycle public meeting is expected to be completed by April 2012.

Task 1b1. Develop robust model design. The Contractor will develop and propose to the stakeholders and CalRecycle project team the design for a robust model that will be used in the Phase II application with a focus on California conditions. This model will be able to consider various regulatory scenarios, including differing levels of re-refining subsidies, and employment of used oil as combustion fuel for energy recovery in properly controlled combustion facilities. Note that this model will be available to other governmental jurisdictions, NGOs, academia, and industry for use in their applications -- but will be utilized in this LCA study for only the California application.

Deliverables: Provide a validated model by the third stakeholder meeting (estimated around April 2011).

Timeline: The model design development is expected to be completed by March, 2011. It will be applied in Phase II subsequently.

Task 1c. Identify data needs and data gaps. Particular attention will be taken by the Contractor to identify data needs and data gaps for the California application as early as possible to attempt to minimize the need for primary data-gathering by the Contractor during Phase II of the project. The Contractor will identify data sources to fill these gaps, such as from the National Renewable Energy Library and US Environmental Protection Agency, other agencies (such as those relevant to pacific grid inventories or transportation fuels), and literature. Present these for acceptability for the study during the stakeholders meetings through Phase I.

Deliverables: Provide a summary of data needs and gaps by the second stakeholder meeting (estimated around January/February 2011). Provide a summary of data sources through July 1, 2011.

Timeline: The summary of data needs and gaps are expected to be completed by January/February 2011. The summary of data sources is expected to be completed by July 2011.

Task 2. Life-Cycle Assessment-analysis Study.

Task 2a. Perform data-gathering. A primary goal of Phase I is to identify and collect a majority of the data necessary to conduct application of the model during Phase II of the LCA life cycle analysis study, however, it is likely ~~Attachment B – Practitioner SOW – 4~~ that the Contractor will need to perform additional data-gathering in order to conduct a the LCA-LCA study, particularly regarding the econometric (regulatory/marketplace) portion of the model/application. The Contractor will confer with the stakeholders, the Contract Manager, and CalRecycle/~~DTSC~~ project team to determine an appropriate level of effort for this subtask before proceeding.

Deliverables: Data gathering.

Timeline: This subtask is expected to be completed by March 2012.

Task 2b. Conduct life-cycle assessment-analysis study. As previously mentioned, a group of stakeholders, including the CalRecycle/~~DTSC~~ project team and LCA-LCA Peer Review contractor, will guide the scope and design of the LCA-LCA study through a series of facilitated meetings and conference calls. Phase I will culminate in the above described Model development and a Stakeholder Project Recommendations Report, generated by the Expert Facilitator contractor. This report will summarize the stakeholder recommendations

Annex B – SOW Practitioner

on the detailed "technical" scope and design of the LCA-life cycle analysis study within the broad bounds defined by SB 546, including goal definition and study boundaries and life-cycle inventory and impact assessment and econometric model methods. In addition, the report will contain all data provided by the stakeholder group for the LCA-LCAn study. The Contractor will use the Stakeholder Project Recommendations Report as a basis to conduct the LCA-LCAn study (model development and application). The Contractor will prepare and submit draft and final LCA-life cycle analysis study reports (see Task 3b.).

Deliverables: Draft and final LCA-LCAn study (for inclusion in the draft and final LCA-LCAn study reports (see deliverables and associated timeline under Task 3b.).

Timeline: These deliverables are expected to be completed by March 2012.

Task 3. Reporting and Presentation.

Task 3a. Quarterly progress reports. The Contractor will prepare and submit quarterly progress reports to the CalRecycle Contract Manager on the progress of each task.

Deliverables: Quarterly progress reports.

Timeline: These deliverables are expected to be completed by December 2012.

Task 3b. LCA-Life cycle analysis study reporting and presentation.

Task 3b.i. Draft LCA-LCAn study report and presentation. The Contractor will prepare and submit a draft LCA-LCAn study report, which will include interpretation of the results.

This preliminary results report will be made available for review by CalRecycle/~~DTSC~~ project team, LCA-Life cycle analysis Peer Review contractor, and stakeholders, and the results (results of the LCA-LCAn scope as defined from Phase I as well as identified data gaps, supportable conclusions, and recommendations for next steps) will be presented at a facilitated stakeholder meeting for comment. CalRecycle also will post the draft report on its website for public comment. The Contractor will coordinate as appropriate with LCA-LCAn Peer Review contractor to respond to any comments from the Peer Review Panel and the stakeholders. The Contractor shall develop a matrix of comments and the Contractor's rationale for addressing those ~~Attachment B – Practitioner SOW – 5 –~~ comments in the report. The Contractor will then revise the LCA-life cycle analysis, prepare a presentation, and present findings of the draft LCA-LCAn study report to stakeholders at stakeholder meeting #5.

Deliverables: Draft LCA-life cycle analysis study report and presentation to stakeholders.

Timeline: The draft LCA-LCAn study report is expected to be completed by September 2012~~4~~. The presentation is expected to be completed by October 2012~~4~~.

Task 3b.ii. Final LCA-LCAn study report. The Contractor will prepare and submit a final LCA-LCAn study report to CalRecycle. The report will be a topic of discussion at a CalRecycle public meeting, and, although comments will be invited and noted, the Contractor is not expected to necessarily further modify the report based on the comments from this public meeting. The Contractor is expected to attend the CalRecycle public meeting (as mentioned in Task 1a.) for the purpose of responding to questions on the LCA-LCAn study from CalRecycle management or the public.

Deliverables: Final LCA-LCAn study report, formatted according to Section VI., below, and participation in the CalRecycle public meeting at the conclusion of the LCA-LCAn study.

Timeline: The final LCA-LCAn study report is expected to be completed by February 2012. The CalRecycle public meeting is expected to be held in April 2012.

IV. CONTRACT/TASK TIME FRAME

Timeframe

Task	Begin	End
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Annex B – SOW Practitioner

1. Provide Technical Assistance to CalRecycle		
1a. Project coordination		
1a.i. Prepare work plan	September 2010-November 2010	October 2010
1a.ii. Convene with project team	November 2010-September 2010	April 2012
1b. Participate in stakeholder meetings	November 2010-September 2010	April 2012
1c. Identify data needs and data gaps	November 2010-September 2010	July 2011
2. Life-Cycle Assessment-analysis Study		
2a. Perform data-gathering	Jan/Feb 2011	March 2012
2b. Conduct LCA-life cycle analysis study	Jan/Feb 2011	March 2012
3. Reporting and Presentation		
3a. Quarterly progress reports	September 2010	December 2012
3b. LCA-LCAn study reporting and presentation		
3b.i. Draft LCA-LCAn study report and presentation	Jan/Feb 2011	October 2011
3b.ii. Final LCA-LCAn study report and participation in CalRecycle public meeting	Jan/Feb 2011	February 2012 & September 2012, respectively

The following provisions will be included in the Terms and Conditions or Special Terms and Conditions of the Contract:

V. COPYRIGHT PROVISION

The Contractor shall establish for CalRecycle good title in all copyrightable and trademarkable materials developed as a result of this Scope of Work. Such title shall include exclusive copyrights and trademarks in the name of the State of California, Department of Resources Recycling & Recovery.

VI. WASTE REDUCTION AND RECYCLED-CONTENT PRODUCT PROCUREMENT

In the performance of this Agreement, Contractor shall use recycled content, used or reusable products, and practice other waste reduction measures where feasible and appropriate. Recycled Content Products: All products purchased and charged/billed to CalRecycle to fulfill the requirements of this contract shall be Recycled Content Products (RCPs), or used (reused, remanufactured, refurbished) products. All RCPs purchased or charged/billed to CalRecycle to fulfill the requirements of the contract shall have both the total recycled-content (TRC) and the postconsumer content (PC) clearly identified on the products. Specific requirements for the aforementioned purchases and identification are discussed in the Terms and Conditions of the Contractual Agreement under Recycled-Content Product Purchasing and Certification.

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The Contractor should, at a minimum, ensure that the following issues are addressed, as applicable to the services provided:

A. WRITTEN DOCUMENT PROVISION

All documents and/or reports drafted for publication by or for CalRecycle in accordance with this contract shall adhere to CalRecycle's *Guidelines For Preparing Reports (available upon request)* and shall be reviewed by CalRecycle's Contract Manager in consultation with one of CalRecycle editors.

In addition, these documents and/or reports shall be printed double-sided on one hundred percent (100%) recycled-content paper. Specific pages containing full-color photographs or other ink-intensive graphics may be printed on photographic paper. The paper should identify the postconsumer recycled content of the paper (i.e., "printed on 100% postconsumer paper"). When applicable, the Contractor shall provide the Contract Manager with an electronic copy of the document and/or report.

To the greatest extent possible, soy ink instead of petroleum-based inks should be used to print all documents.

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Annex C - Comments on possible wording as basis for SOW for Peer review

WORK TO BE PERFORMED

The Contractor (peer review chairperson) will serve as the chair and oversee an independent peer review panel for the used oil life cycle analysis (LCAn) study to ensure that

- The methods used to carry out the Life Cycle Assessment elements are consistent with ISO 14044, and other relevant standards (for example ISO 14051 on Material Flow Cost Accounting)
- The methods used to carry out the LCA are scientifically and technically valid,
- The data used are appropriate and reasonable in relation to the goal of the study,
- The interpretations reflect the limitations identified and the goal of the study, and
- The study report is transparent and consistent.

TASKS IDENTIFIED

All written deliverables are subject to the chairperson's written approval.

Task 1. The chairperson shall assemble and lead a peer review panel.

Task 1.a. The chairperson shall identify and contract with at least two external independent experts to serve on the peer review panel. This panel may include other interested parties affected by the conclusions drawn from the LCA, such as government agencies, non-governmental groups, competitors and affected industries. [UOTF WOULD SUGGEST THAT THE FOCUS SHOULD BE ON EXPERIENCED PRACTITIONERS RATHER THAN EXPERTS WITH NARROW EXPERTISE IN PARTICULAR TECHNOLOGIES. CARE NEEDS TO BE TAKEN TO ENSURE THT THAT THE PANEL IS BALANCED AND AVOIDS ANY BIAS TO A PARTICULAR TECHNOLOGY]

Task 1.b. The chairperson shall ensure that all peer review panel members receive exactly the same exposure to the LCA Practitioner, the LCA Facilitator, the LCA stakeholders and any and all LCA documentation. The chairperson shall ensure that such exposure is managed so as to ensure the detached objectivity of the peer review panel members throughout the conduct of the LCA. [MAINTAINING THE INDEPENDENCE, BALANCE AND DETACHMENT OF THE PEER REVIEW PANEL IS CRITICAL.]

Task 1.c. The chairperson shall lead the peer review panel members in developing and adopting procedures whereby the panel will complete the following tasks.

Task 2. The chairperson shall lead the peer review panel in reviewing and approving the methodologies and workplans proposed by the study Practitioner and the Facilitator prior to their being used to undertake the LCAn to ensure that they are (i) consistent

41 with ISO 14044 and (ii) scientifically and technically valid and suitable for addressing the
42 objectives that are to developed

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44 Task 3. The chairperson shall lead the peer review panel in reviewing and approving the
45 data to be used in the LCA to ensure that they are appropriate and reasonable in
46 relation to the goal of the study.

47 Task 4. The chairperson shall lead the peer review panel in reviewing and approving
48 the LCA Practitioner's final study report to ensure that it is transparent and consistent.
49 Upon completion of the final LCA study report by the LCA Practitioner, the chairperson
50 shall submit a written report containing the peer review panel's review and comments
51 that will be included as an appendix to the final Legislative report prepared by
52 CalRecycle.

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1 **Annex D**

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3 Article “The Great Plate Debate” Sustainable Flexo, Flexo mag October 2008

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5 Please refer to:

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7 <http://digital.realviewtechnologies.com/?xml=flexomag.xml&iid=18930&startpage=5&crd=36.11%49.67%9.19%1.27%00FF00zz45.14%82.75%2.94%0.88%00FF00zz30.72%83.90%.6.25%0.90%00FF00zz83.50%75.46%4.33%3.06%00FF00zz78.81%78.40%2.94%0.90%00FF00zz86.28%78.40%.6.25%0.90%00FF00zz&searchKey=plate>

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12 **Annex E**

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14 Please see separate file - 030701-all-unctad eco-efficiency manual, downloaded from:

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16 http://www.unctad.org/en/docs/iteipc20037_en.pdf

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18 **Annex F**

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20 Please see separate file - 060511-all-drinking cup LCA and EEA, downloaded from:

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22 <http://www.mech.kuleuven.be/lce2006/036.pdf>

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