

# **Contract to Conduct a Feasibility Study and Develop a National Used Oil Management Plan for Samoa, Solomon Islands, Tonga, and Vanuatu**

## **Samoa Analysis Report**

**September 2022**

**David Haynes & Katenia Rasch  
Going Troppo Consulting for Araspring Consulting Ltd**



**SPREP  
PROE**

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## Executive Summary

The overall work covered in this project is funded by the *Agence française de Développement* (AFD), referred to hereafter as “Committing to Sustainable Waste Actions in the Pacific (SWAP)”, and it aims to improve sanitation, environmental, social, and economic conditions in Pacific Island countries and territories through proper waste management. To achieve this, the overall work focuses on three streams of wastes: used oil, marine debris, disaster wastes and an overarching issue on sustainable financing mechanisms. Eight countries and territories will benefit from this overall project which include Fiji, French Polynesia, New Caledonia, Samoa, Solomon Islands, Tonga, Vanuatu, and Wallis and Futuna. This project focuses exclusively on used oil and four countries have been chosen to benefit, namely Samoa, Solomon Islands, Tonga and Vanuatu. The main outcome of the project is a National Used Oil Management Plan for each country.

Each national project is being completed in five stages:

- Inception – introductory meetings and desktop study of available information
- Analysis – gathering current data and discussions with stakeholders
- Feasibility Study – preparation of a feasibility study report for consultation
- Draft Used Oil Management Plan – the plan will be based on the feasibility study and consultation
- Final Used Oil Management Plan – finalization of the plan after further consultation and feedback.

This report is the Analysis Report for the Samoa component of the work. This phase of work was essentially local data gathering and Ms Katenia Rasch attempted to interview a large number of people to gather the data, both in person and by phone. The following conclusions were drawn as a result of the data gathering work:

- a) Based on information supplied by Samoa Customs, an average of 740,000 litres of oil is imported into Samoa per annum (2018-2021).
- b) The annual quantity of lubrication oil imported into Samoa is highly variable and is largely independent of GDP ( $R^2 = 0.275$ ).
- c) Customs do not collect information on the different types of lubricants imported into the country, and as a consequence, it is impossible to differentiate lubricant imports by type from Customs import data.
- d) It has been estimated, taking into account used oil generation from all relevant oil products, that 280,000 – 380,000 litres/year of used oil is being generated nationally and not being managed properly in Samoa.
- e) The bulk of used oil is still being used to mark sports fields and to lubricate industrial and smaller sized equipment.

- f) Some progress has been made in the short-term storage of used oil through the distribution of IBCs to SRWMA and on to used oil generators; and the commencement of a limited, fee for service used oil collection trial at the SRWMA (SWOMP) Storage Facility.
- g) Workshops have reported that some used oil and car oil filters are also being disposed of to land.
- h) There are currently no local (national) used oil reuse options.
- i) A majority of stakeholders including the Chamber of Commerce are firmly opposed to the introduction of any form of advanced recycling tariff on imported oil products.
- j) MNRE have identified improved management of used oil as a national priority.
- k) MNRE has the legislative power to introduce national used oil management regulations but have not acted on this.
- l) No current viable option for used oil export have been identified by stakeholders and JICA to date, and no export of used oil has taken place from Samoa to date (September 2022).
- m) It is concluded that used oil management has not progressed in Samoa over the last 10 years and outcomes proposed in previous strategies, policies and cost-benefit analysis are still relevant, but have not been adopted by government or more widely by stakeholders.
- n) This data gathering phase of the project has been difficult due to pandemic restrictions and the reluctance of many stakeholders to engage, but it is considered that sufficient information has been gathered to move on with some confidence to the next stage of the project, i.e. the Feasibility Study.
- o) The Feasibility Study will aim to come up with a clear direction, backed up with supporting evidence, for the preparation of a detailed National Used Oil Management Plan.

## Abbreviations

ADF	Advanced Disposal Fee (Levee)
AFD	<i>Agence Française de Développement</i>
BPS	Bluescope Pacific Steel
CBA	Cost Benefit Analysis
COP	Code of Practice
EPC	Electrical Power Corporation
GDP	Gross Domestic Product
GEFPAS	Global Environment Facility - Pacific Alliance for Sustainability
IBC	Intermediate Bulk Containers
JICA	Japan International Cooperation Agency
MNRE	Ministry of Natural Resources and Environment
MoF	Ministry of Finance
PAHs	Polycyclic aromatic hydrocarbons
PCBs	Polychlorinated biphenyls
PIC	Pacific Island Country
PPE	Personal Protective Equipment
PPM	Part per million
PPS	Pacific Product Services
SAICM	Strategic Approach to International Chemicals Management (Programme)
SPA	Samoa Port Authority
SPREP	Secretariat for the Pacific Regional Environment Programme
SRWMA	Samoa Recycling and Waste Management Association
SSC	Samoa Shipping Corporation
SWAP	Committing to Sustainable Waste Actions in the Pacific
SWIRE	SWIRE Shipping
SWOMP	Samoa Waste Oil Management Programme
TT	Tanktainer
UNEP	United Nations Environment Programme

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## 1.0 AFD Programme to Develop a Used Oil Management Plan

### 1.1 Project Background

Pacific Island Countries and Territories (PICTs) are under increasing pressure from development and growing human population, and the social and economic pressures associated with this growth. Increased populations and urbanisation have led to increased product imports, production, and waste generation. Much of the waste generated through these imported products cannot be economically managed due to issues of small and isolated populations; economic volatility; geographical isolation from large economies; limited institutional, financial and human capacity; and inadequacy of infrastructure to capture and process waste materials. Poor waste management poses risks to the economies of PICTs, as most rely heavily on clean environments for agricultural activities and a vibrant tourism industry.

The overall work covered in this project is funded by the *Agence française de Développement* (AFD), referred to hereafter as “Committing to Sustainable Waste Actions in the Pacific (SWAP)”, and it aims to improve sanitation, environmental, social, and economic conditions in Pacific Island countries and territories through proper waste management. To achieve this, the overall work focuses on three streams of wastes: used oil, marine debris, disaster wastes and an overarching issue on sustainable financing mechanisms. Eight countries and territories will benefit from this overall project which include Fiji, French Polynesia, New Caledonia, Samoa, Solomon Islands, Tonga, Vanuatu, and Wallis and Futuna.

This particular project focuses exclusively on used oil and four countries have been chosen to benefit, namely Samoa, Solomon Islands, Tonga and Vanuatu. The main outcome of the project is a National Used Oil Management Plan for each country. As part of this process, *Araspring Ltd* (New Zealand) in association with *Going Troppo Consulting* (Australia), *Pacific Reef Savers* (New Zealand) and *POPs Environmental Consultants Ltd* (New Zealand) were awarded a contract by SPREP/AFD to develop used oil management plans for Samoa, Solomon Islands, Tonga and Vanuatu in December 2021. This report focuses on the **Samoa** component of the work.

### 1.2 Project Deliverables

The overall project deliverables are set out in Table 1 below:

*Table 1: Project Deliverables*

Deliverables	Task	Due Date
1. Inception Meeting	1.1 Participate in an initial meeting with the SWAP PMU organised by SPREP	Within two weeks of the project commencement on 10 January 2022
2. Inception Report	2.1 Host an Inception Workshop with National stakeholders 2.2 Undertake a detailed desktop review of existing legislation, policy, strategy and plans that address waste management, institutional frameworks, and other enabling frameworks relevant to waste management	Within 1 month following Inception meeting
3. Analysis Report	3.1 Undertake an analysis of used oil production and existing used oil collection, storage, treatment, disposal and export services 3.2 Analyse findings against government and stakeholder priorities	Within 2 months following approval of the Inception Report
4. Feasibility Study Report	4.1 Development of a feasibility study based on all the information gathered and data obtained through the consultations, interviews, and investigations 4.2 Feasibility Study Presentation	Within 2 months following approval of the Analysis Report
5. Draft National Used Oil Management Plans	5.1 Compile all the gathered information to develop a Draft National Used Oil Management Plan 5.2 National Stakeholder Presentation	Within 2 months following approval of the Feasibility Study Report
6. National Used Oil Management Plans	6.1 Final national used Oil Management Plans	Within 1 month following approval of the Draft National Used Oil Management Plans

### 1.3 Used Oil Background

Used oil is defined as any petroleum-based or synthetic oil or fluid that, through contamination, has become unsuitable for its original purpose due to the presence of impurities or loss of original properties. This covers all used oil consistent with the

classification of hazardous waste under the Waigani<sup>1</sup> and Basel Conventions<sup>2</sup>. This includes any semi-solid or liquid product consisting totally or partially of mineral oil or synthesised hydrocarbons (synthetic oils), oily residues from tanks, oil-water mixtures and emulsions. These may be produced from industrial and non-industrial sources where they have been used for lubrication, hydraulic movement, heat transfer, electrical insulation or other purposes and whose original characteristics have changed during use, thereby rendering them unsuitable for further use for the purpose for which they were originally intended.

Large volumes of used oil can potentially enter aquatic ecosystems in water runoff from urbanized areas. Typically, oil spilled on soil migrates downward by gravity into ground waters, and spreads laterally via capillary forces and soil heterogeneity. Once in the environment, oil hydrocarbons and associated metals may persist for years. Ingested oil may adversely impact the ability of animals to digest food and damage their intestinal tracts. Oil also reduces the insulating capacity of animal furs and the water repellency of bird feathers increasing morbidity and mortality due to exposure and eventual drowning. There are also major community health considerations around the fate of used oil due to its toxicity. Used oils typically contain a range of compounds that may have adverse impacts when released into the environment. These compounds include polycyclic aromatic hydrocarbons (PAHs), heavy metals, additives and antioxidants, trace levels of chlorinated solvents, and polychlorinated biphenyls (PCBs). Exposure to these compounds can result in damage to the liver, kidneys, heart, lungs and nervous system. Poly-aromatic hydrocarbons are also potent carcinogens. Oil concentrations as low as one part per million (ppm) can contaminate drinking water.

## 1.4 Analysis Report

Under the terms of the contract, the Consultant is required to:

- **Document** used oil production and existing used oil collection, storage, treatment, disposal and export services to determine logistical issues and opportunities related to national used oil management; and to
- **Analyse** these findings with respect to government and stakeholder priorities determined at the inception stage of the project.
- **Provide a clear premise** for the product and geographical scope and likely services necessary to meet the stated government and stakeholder needs within a draft national Used Oil Management Plan.

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<sup>1</sup>Convention to ban the importation into Forum Island countries of hazardous and radioactive wastes and to control the transboundary movement and management of hazardous wastes within the south Pacific region (1995).

<sup>2</sup>Basel Convention on the control of transboundary movements of hazardous wastes and their disposal and Annexes and Amendments (1998)

## 1.5 Assistance Provided

***Assistance provided for the Samoa component of the work is acknowledged here with thanks:***

- The local data gathering was carried out by Ms Katenia Rasch. This was a very significant effort and a large number of stakeholders were approached (some on numerous occasions).
- Fiasoso Siaso and Darren Bately of MNRE also provided considerable support and assistance at this data gathering phase of the project.
- In addition, numerous stakeholders, also gave of their time to supply valuable information.

## 2.0 Procedures Used for Data Gathering

### 2.1 Used Oil Sources

Used oil can originate from many sources and the following sources (where practical) were explored:

- Engine oil – typically includes crankcase oils from gasoline, diesel and LPG/CNG engines (often the main sources)
- Engine Oil Filters
- Brake fluids
- Gear oils
- Transmission fluids
- Hydraulic oils and fluids
- Compressor oils
- Refrigeration oils
- Industrial process oils
- Electrical insulating oil (Care must be taken to exclude oil likely to contain PCBs)
- Metalworking fluids and oils
- Heat transfer oils
- Machining oils
- Ship's slops, bilge water, tank cleanings produced by vessels during normal shipboard operations
- Bottom clean-out waste from virgin fuel storage tanks, virgin fuel oil spill clean-ups, or other oil

### 2.2 Sources of Used Oil Contamination

It is important to note that some potential components of used oil should be excluded from used oil collections, mainly for safety reasons – flammability and toxicity. Checks were made to assess how these items can be screened out. These potential components included:

- Petroleum distillates used as solvents, such as turpentine, kerosene, parts-washing solvents
- Petrol and/or diesel (including biofuels) – including mixtures from refueling errors
- Antifreeze, radiator flushing, or other inhibitor packages
- Oils derived from animal or vegetable fats and oils – including those used as a lubricant

- Paint and paint brush washings
- Chlorinated oil or solvents
- Any virgin or used oil which may contain PCBs (> 5 mg/kg)
- Soluble cutting fluids

The occurrence of such items was, where possible, noted as other hazardous waste disposal solutions will be needed for these chemicals.

### 2.3 Inappropriate Uses of Used Oil

There are many methods used for disposal of used oil that are inappropriate and examples of these were noted where they were observed. These include:

- disposal on the ground, or into watercourses, sewers or drainage systems
- burial
- using used oil for dust control, weed abatement, vegetation control, timber preservation by painting, staining or dipping,
- pest control or as a carrier fluid for agrichemicals (pesticides or herbicides)
- use as a marker, e.g. on playing fields as it still readily available, cheaper and lasts much longer than paint.
- placing used oil in rubbish bins to be collected as part of household waste
- open-air burning
- combustion in, for example, kerosene burners
- any other practices, in which the used oil may cause contamination of the ground and groundwater, migrate to watercourses, contaminate air or have negative impacts on humans, plants, animals or other organisms.

### 2.4 Methods of Used Oil Management

Methods of used oil management, including collection and storage, were examined and a determination was made as to the suitability of such storage, including consideration of the following matters:

- Where IBCs (intermediate bulk containers) are used for the collection, storage and transportation of used oil, these must be sound and of good quality. They should not be left in the sun as UV light will break them down.
- Steel drums will corrode and leak, especially where the used oil is mixed with water.
- Plastic drums will deteriorate, especially if left in the sun.

- Bulk storage facilities must be maintained in good condition, regularly inspected and have good secondary containment. They need proper spill control equipment, fire extinguishers and emergency response procedures in place.
- Long term storage may result in the accumulation of sludges that are difficult to remove by pumping.

## 2.5 Disposal Facilities

When present, local disposal facilities were assessed. The only centralized disposal (storage) facility is the recently opened oil storage facility located at the *SRWMA (SWOMP) Storage Facility* (see Section 8).

## 2.6 Methods of Data Collection

Data collection was carried out through personal visits, emails and phone interviews. Phone calls were also made to follow up on personal visits. Covid pandemic travel restrictions curtailed personal interview visits until late in the project.

Local data gathering was a very significant effort, and a large number of stakeholders were approached (some on numerous occasions). However, despite these efforts, a number of Stakeholders chose not to participate in the data collection.

It was sometimes difficult to determine the sources and composition of used oil generated and used oil stockpiled. Source, quantities and composition were checked through questioning all parties involved, and care was taken to observe contamination from undesirable sources.

The list of questions asked of stakeholders are contained in Appendix 1. A form was also sent out by email and/or delivered personally. This form was accompanied by an endorsement letter from MNRE, which was updated and distributed twice following a general lack of response from stakeholders.

## 3.0 Relevant Policy and Legislation

Management of waste (including used oil) in Samoa is carried out under the Samoan Waste Management Act (2010). Under Section 4 of the Act, the Samoan Ministry of Natural Resources and Environment (MNRE) is responsible for implementation of the Act and the regulation and management of waste in Samoa. The functions and responsibilities of the Ministry under the Act include:

- Preparation, adoption and enforcement of rules, operating manuals, codes of practice and standards regulating activities associated with the management of waste in Samoa (Section 4k); and
- Formulation, implementation and enforcement of policies, programs, initiatives, standards and requirements to reduce the generation of waste (Section 4o).

### 3.1 Waste types covered under the Act

The waste included under the Act may be determined to be a waste or a hazardous waste for the purpose of the Act either through Regulations made under Section 6a of the Act; or by written determination by the Chief Executive Officer (Section 6b). Under Section 2 of the Act, "Hazardous waste" includes any waste which is, or which has the potential to be toxic or poisonous, or which may cause injury or damage to human health or the environment.

### 3.2 Waste regulations

The Head of State (acting on the advice of Cabinet) may make Regulations for the proper management and regulation of waste in Samoa and for the management and operation of approved waste management operators (Section 43(1)). Regulations may be made which specify toxic and hazardous waste and regulate the manner in which such waste may be stored, transported and disposed of (Section 43(2)).

### 3.3 Waste related levies

The Head of State (acting on the advice of Cabinet) may make Regulations which impose special levies on particular goods which have adverse effects on the environment, or for the purpose of raising revenues for the effective management of waste (Section 10).

### 3.4 Used oil storage, collection and transportation regulations

Transportation of bulk used oil from collection points to bulk storage or to point of use must be regulated to ensure best environmental practice. The same must be applied for storage. This must consider issues such as:



- All vehicles and drivers used in the collection of used oil must comply with all Transport Authority registration and licensing requirements;
- Transportation of used oil in suitable, covered containers;
- Appropriate labeling of transport containers; and
- Access to suitable accidental spill containment equipment and personal protective equipment.

## 4.0 Policy, Strategy and Planning Documents

A number of national strategic planning and policy documents have been prepared in the past that are relevant to national used oil management in Samoa. These include:

### 4.1 The National Waste Management Policy (2001)

The National Waste Management Policy includes objectives of involvement of the private sector in waste recycling, cost recovery and promotion of recycling of waste materials.

### 4.2 The National Chemicals and Hazardous Waste Management Policy (2012)

The National Chemicals and Hazardous Waste Management Policy (2012) looks at options for the sustainable management of chemicals and hazardous waste throughout their lifecycle and identifies key priority actions already outlined under the first Strategic Approach to International Chemicals Management Project (SAICM).

### 4.3 The Draft Samoan National Used Oil Management Policy (2013)

The Draft Samoan National Used Oil Management Policy (2013)<sup>3</sup> was designed to establish and operate an appropriate management framework that improves national management of used oil and promotes shared used oil management responsibility by all stakeholders. The Policy covered all used oil consistent with the classification of hazardous waste under the Waigani and Basel Conventions. This includes any semi-solid or liquid product consisting totally or partially of mineral oil or synthesised hydrocarbons (synthetic oils), oily residues from tanks, oil-water mixtures and emulsions. These may be produced from industrial and non-industrial sources where they have been used for lubrication, hydraulic movement, heat transfer, electrical insulation or other purposes and whose original characteristics have changed during use, thereby rendering them unsuitable for further use for the purpose for which they were originally intended. The Samoan Government was identified as the lead agency in the development of national OHS and environmental guidelines for the management of used oil and the National Petroleum Industry the lead agency for used oil collection and removal and the lead in provision of used oil management training.

### 4.4 The National Chemical Management Strategy (2007-2017)

The National Chemical Management Strategy provides a framework for sustainable management of all chemicals. It includes the activities of procurement, transportation, storage, distribution, use, and disposal.

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<sup>3</sup>SPREP (2013). *National Used Oil Management Policy (2013-2016)*. MNRE. 7pp.

#### 4.5 A National Waste Management Strategy (2019-2023)

A National Waste Management Strategy developed under the Waste Management Act, distinguishes between solid waste, and chemical and hazardous waste. The Strategy defines chemical and hazardous waste as substances or matter that are toxic and poisonous, which may harm human health or the environment (e.g., e-waste, waste oil, batteries, healthcare waste, asbestos, persistent organic pollutants (POPs) etc). The Strategy includes analysis of current chemical/hazardous waste management systems, identifies issues, and priorities.

#### 4.6 The GEF-PAS Waste Oil Strategy Enhancement (2011)

The GEF-PAS Waste Oil Strategy Enhancement (2011)<sup>4</sup> summarised used oil management status at the commencement of the GEFPAS programme (2014). Petroleum Product Supplies Ltd (PPS) was the sole importer and distributor of petroleum fuels for Samoa, imported 160-200,000 litres of lubricants per year (2011), which included engine lubricants, hydraulic and transmission fluids, and gearbox oil. The other major suppliers were Gold Star and Samoa Spare Parts, but there were also numerous other smaller importers, because the market was unregulated. Samoa's total oil imports were about 0.8-1.0 million litres per year. As of 2011, the only oil recycling facility in the region was in Guam<sup>5</sup>. The Guam Refinery and Environmental Services Company accepted used oil from individuals, businesses and other local producers and has recycled a little more than three million gallons of oil 1993-2009. The process involved pre-treatment to remove water, followed by distillation, which produces a naphtha product and gas oil. These are further processed and blended with other feedstock to produce a diesel-type product. An oil recycling plant was also established in Samoa in 1993<sup>6</sup>. The plant took in oil from local producers and also imported it from nearby islands such as American Samoa. The treatment process involved drying, acid neutralisation and filtration, followed by blending with additives to produce a recycled oil product. The plant was shut down after several years due to problems with import/export duties and a lack of consumer demand for the finished product.

#### 4.7 The National Environment Sector Plan (2017-2021)

The National Environment Sector Plan (2017-2021) noted ongoing improvement to solid waste management as a key national achievement and identified current waste management priorities including sound management of chemicals and hazardous waste and wastewater and operationalization of deposit levy schemes.

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<sup>4</sup>Graham (2011). *GEF-PAS Project on Pacific POPs Release Reduction through Improved Management of Solid and Hazardous Wastes: Consultancy Report: Organic Waste and Waste Oil Strategy Enhancement*. SPREP. 59pp.

<sup>5</sup>Delfin, J. (2009). Environmental Story. Guam Business Magazine, [http://www.guambusinessmagazine.com/?pg=vol26\\_01\\_feature03](http://www.guambusinessmagazine.com/?pg=vol26_01_feature03)

<sup>6</sup>Hill and Ward (1993). *Recycling Oil for Profit in Western Samoa*. SPREP, Apia.

## 5.0 Previous Used Oil Reports

Improved mechanisms for national used oil management in Samoa were investigated and proposed between 2012-2020. These are summarized below:

### 5.1 The Used Oil Audit Report (2012)

The Used Oil Audit Report (2012)<sup>7,8</sup> presented data collected during an audit of used oil management in Samoa undertaken in 2012 for the AFD/GEFPAS programme. Data collected are summarized in Table 2.

*Table 2. Oil import and use data 2009-2011<sup>9</sup>*

Lubricant Use Group	Quantity of oil imported (1,000lt pa)	Quantity of oil used (1,000lt pa)	Used oil production (1,000lt pa)
Auto Traders	360		
Construction Industry		228	Included in bus and haulage
Garages		165	112
Bus and Haulage	185	149	113
Petroleum Product Supplies (PPS)	71		
Samoa Shipping Corporation (SSP)		47	
Electric Power Corporation (EPC)		42	23
Smaller importers	43		
<b>ESTIMATED TOTALS</b>	<b>660</b>	<b>630</b>	<b>248</b>

The 2009-2011 audit concluded that:

- Major oil importers were Goldstar, Ott Transport, Samoa Spare Parts and PPS (total of ~616,000lts oil imported per annum). Smaller retailers accounted for another 7% of oil imports.
- Most lubricating oils were used in the local transport and construction industries.
- The Electrical Power Corporation (EPC) used 6% of lubricating oil imported into Samoa.
- Petroleum Product Supplies Ltd (PPS), as the Samoan Fuels Distributor and Terminal Operator, has storage tank capacity of 185,000 litres for its own used oil and for fuel slops generated from terminal activities.

<sup>7</sup>Envirocare Engineering Consult Ltd (2013). *Cost Benefit Analysis of Used Oil Management Options for Samoa*. Unpublished Report to the Secretariat of the Pacific Environment Programme. 31 pp.

<sup>8</sup>Haynes, Loney and O'Grady (2018). *Desktop Review of Used Oil Management Data*. Consultancy to Assist SPREP and Pacific Island Countries in an Assessment of Options for Future Used Oil Management. 21pp.

<sup>9</sup>Envirocare Engineering Consult Ltd (2013). *Cost Benefit Analysis of Used Oil Management Options for Samoa*. Unpublished Report to the Secretariat of the Pacific Environment Programme. 31 pp.

- EPC had tankage of 185,000 litres at its *Tanugamanono* plant site that could be made available for national storage of used oil.
- Nearly all used oil collection sites were poorly managed.
- Used oil was used for a wide range of purposes in Samoa that are not sustainable or environmentally acceptable.
- The cost of shipping a 20ft container from Apia to Fiji in 2018 was \$US3,500. This does not include the collection, loading and unloading of the drums, port handling fees or insurance costs.
- The cost of shipping a 20ft container from Apia to India in 2018 was \$US1,870. This does not include the collection, loading and unloading of the drums, port handling fees or insurance costs.

## 5.2 A Used Oil Management Plan for Samoa (2014)

A Used Oil Management Plan for Samoa (2014)<sup>10</sup> detailed a potential used oil stewardship system for Samoa. The plan outlined the roles and responsibilities of a proposed Managing Agency to be established for the enforcement and monitoring of the collection and storage of used oil for its reuse, recycle or export. The Plan identified a National Regulatory Framework on which a Stewardship System was to be based, the structure and functioning of the Proposed Managing Agency and the necessary implementation stages for collection, storage, disposal and re-use of used oil and related monitoring and evaluation measures. A Cost Benefit Analysis study was completed that assessed options available to Samoa to manage used oil. The analysis concluded that in the short to medium term, using the used oil as a supplementary fuel source for electrical generation was the most cost-effective and environmentally sustainable solution. (This option is no longer considered viable as it would void the warranties on new generators installed by EPC). The costs of collection, storage, and possible shipment of used oil for recycling was proposed to be recovered from the oil purchaser through a levy placed on the oil when it was imported into the country. The development of collection system for used oil on Upolu and Savaii was examined in detail in consultation with stakeholders. It proposed establishing temporary storage sites with plastic drums (150 litre) and/or IBC's (1,000 litre). Ideally the containers would be stored undercover and placed in a bunded area to contain any spillages. Collection locations were identified at service stations, hauliers/bus companies, construction companies, Samoa Shipping Corporation, and Electric Power Corporation (EPC). Bulk storage for collected oil was to be established at either the EPC or Petroleum Products Supplies (PPS).

## 5.3 A Cost Benefit Analysis of Used Oil Management for Samoa (2014)

A Cost Benefit Analysis of Used Oil Management for Samoa (2014)<sup>11</sup> was completed in

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<sup>10</sup>MNRE (2014). *Used Oil Management Plan for Samoa*. SPREP. 38pp.

<sup>11</sup>Haynes and Vanderburg (2013). *Cost-benefit analysis of used oil management options for Samoa*. SPREP. 31 pp.

2014. It was estimated that approximately 250,800 litres of used oil were generated per annum (38% of the imported volume). The relative costs of environmentally sustainable and practical options for used oil disposal for Samoa at that time are summarised below:

*Table 3. Potential used oil disposal options (2012)*

<b>Practical Option</b>	<b>Levy to fund disposal (WST per litre)</b>	<b>Advantages of this disposal option</b>	<b>Disadvantages of this disposal option</b>
<b>Used oil added as a diesel fuel augments for local electricity generation (no longer viable)</b>	<b>Levy cost of 2% of oil purchase price (i.e. 0.18 WST per lt).</b>	<i>Generates local income from used oil.</i>	<i>Must include the use of a diesel particulate filter and catalytic converter to avoid breaching the Stockholm Convention and the Samoan Waste Management Act. Will only be a disposal option until 2020 when Samoa becomes energy self sufficient</i>
<b>Point of sale addition of used oil (at a concentration of &lt;1%) to all diesel fuel sold in Samoa</b>	<b>Levy cost of 2% of oil purchase price (i.e. 0.18 WST per lt).</b>	<i>Generates income from used oil.</i>	<i>May breach the Samoan Waste Management Act and will breach the Stockholm Convention if vehicles are not fitted with filters and catalytic converters. May void engine warranties. Requires ongoing co-operation and good will of PPS</i>
<b>Used oil shipped offshore for disposal to India</b>	<b>Levy cost of 9% of purchase price (i.e. 0.71 WST per lt).</b>	<i>Environmentally sustainable option. Will have to be used when Samoa uses 100% renewable energy by 2020</i>	<i>More expensive disposal option</i>
<b>Used oil shipped offshore for disposal to Fiji</b>	<b>Levy cost of 10% of purchase price (i.e. 0.78 WST per lt).</b>	<i>Environmentally sustainable option. Will have to be used when Samoa uses 100% renewable energy by 2020</i>	<i>More expensive disposal option</i>

The analysis recommended that:

- Appropriate regulations and associated levy fee structures be developed for used oil management in Samoa.
- Appropriate collection and storage mechanisms for used oil be established as soon as possible.
- A detailed comparison analysis of the total relative costs to collect and ship used oil offshore to American Samoa, Asia, Australia, Fiji, India, and New Zealand for reuse be completed.

#### 5.4 Samoa Waste Characterization and Situation Analysis Report (2021)

A comprehensive waste audit was completed in Samoa in 2019<sup>12</sup> to gather waste management data that was robust, reliable, current, and comparable across the Pacific region. Limited used oil information was collected during this survey which reported that as of 2019:

- 70m<sup>3</sup> (70 tonnes) of used oil is generated in Samoa per year (96% of this used oil is generated in Upolu, the remainder in Savaii).
- Approximately 264 m<sup>3</sup> used lubricating oils are currently stockpiled.
- Used oil stockpiles could be located at several sites across Samoa, including the Electric Power Corporation station at Tanugamanono, Hyundai workshop in Vaitele, Samoa Shipping Company, mechanic workshops, transportation companies, and several oil importers and suppliers.
- It reported that an estimated 500,000 liters of used oil had been accumulated over the last 1-10 years in Samoa.

#### 5.5 JICA, “Data Collection Survey on promotion of recycling plastics and other materials in Pacific Island Countries” (2021)

A comprehensive JICA survey<sup>13</sup> carried out in 2021 estimated used oil generation rates in Samoa based on past surveys and then extrapolated these estimates out to 2030 (Table 4). However, these forward estimates are considered inaccurate by other experts as they assume a high correlation between GDP and lubricant importation rates (see Section 7.1).

*Table 4. Estimated used oil generation rates\**

	<b>2014</b>	<b>2020</b>	<b>2030**</b>
Used oil generation rate (Its per annum)		287 tonnes pa	410 tonnes pa
Used oil contained in EOL vehicles (Its)		57 tonnes pa	82 tonnes pa
<b>Total used oil generated (Its pa)</b>	<b>250-270,000 Its</b>	<b>382,000 Its (344 tonnes pa)</b>	<b>547,000 Its (492 tonnes pa)</b>

Conversion rate of 0.9 kg per ltr of used oil

\*\*Based on expected annual national GDP increases

<sup>12</sup>World Bank (2021). *Samoa Waste Characterization and Situation Analysis Report*. 132pp

<sup>13</sup>JICA (2021). *Data Collection Survey on promotion of recycling plastics and other materials in Pacific Island Countries*.

## 5.6 SRWMA Waste Oil Collection and Storage Pilot Project Implementation Report Phase 1 (2022)

The Samoa Recycling and Waste Management Association (SRWMA) was the first recycling association established in the Pacific Island Countries in 2018. The Samoa Waste Oil Management Plan (SWOMP)<sup>14</sup> was launched in 2019 by SRWMA. A one-day training in used oil collection and storage was held in August 2019 and used oil collection and storage facilities at the *SRWMA (SWOMP) Storage Facility* were complete in February 2021.

The Waste Oil Collection and Storage Pilot Project Implementation Report Phase 1 (2022) documented important issues connected with trial used oil collection logistics, costs and rates obtained through a small, short-term trial carried out in 2021 as part of SWOMP.

- The trial collected 41,000 lts of used oil over a 4-day collection period.
- Most oil was (stored in, and) collected in steel drums.
- The steel drums were often in poor condition, with around 10% of all collected drums leaking.
- A lack of appropriate collection equipment hampered collection and transfer operations, particularly for large stockpiles of used oil.
- Record keeping is substandard.
- The *SRWMA (SWOMP) Storage Facility* did not have appropriate PPE and cleaning and spill disposal equipment.

In summary the trial identified that:

- A lack of dedicated personnel and equipment at the storage site hampered the trial.
- Leaking containers hampered collection efforts.
- The current collection fee of 20 Tala per lt per used oil was insufficient to meet collection costs.
- The collection fee would need to be at least doubled for the collection scheme to be economically viable.
- Importantly, the collection fee does not cover the cost of final disposal of the collected used oil.
- MNRE have an obligation to provide public awareness and education, capacity development and monitoring and reporting functions under the scheme.

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<sup>14</sup>JPRISM (2022). *SRWMA Waste Oil Collection and Storage Pilot Project Implementation Report Phase 1*. J-PRISM II (Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II)



## 6.0 Lubricating Oil Importation Data

### 6.1 Customs Information

The following (Table 5 below) contains the information obtained from the Samoan Department of Customs, regarding the import of lubricating oil and related products. Only three Tariff lines are recorded by Customs, limiting the potential usefulness of the collected data. This data can be compared with the annual oil import data collected from Customs in 2011 which recorded that around 594,000lts of oil was imported into Samoa at that time<sup>15</sup>.

*Table 5. Customs Data, Samoan oil imports 2018-2021 (1,000lt)<sup>16</sup>*

Oil Type	HS Tariff Code <sup>17</sup>	2018	2019	2020	2021
Petroleum oils	2709.00.00	153	161	37	
Lubricating oils	2710.12.70	541	792	612	544
Petroleum oils	2710.20.00	12		60	123
<b>Total</b>		<b>706</b>	<b>953</b>	<b>709</b>	<b>667</b>
<b>Four Year Average</b>					<b>740</b>

### 6.2 Pacific Product Services (PPS)

Representatives from Pacific Product Services indicated that approximately 400,000 litres of lubricating oils were imported annually into Samoa by PPS. Oils were sourced from many locations including Singapore, Australia, New Zealand, American Samoa and China. The major end users of these imported oils include the Electrical Power Corporation (EPC) and Samoa Shipping Corporation (SSC) for use in generators, vessel engines and the construction and transport industries. The relative quantities of the different types of imported oils provided by PPS are identified in Table 6.

*Table 6. Samoa oil import information (PPS)*

<sup>15</sup>Envirocare Engineering Consult Ltd (2013). *Cost Benefit Analysis of Used Oil Management Options for Samoa*. Unpublished Report to the Secretariat of the Pacific Environment Programme. 31 pp.

<sup>16</sup>Samoa Customs data (2022)

<sup>17</sup><https://www.abs.gov.au/statistics/classifications/australian-harmonized-export-commodity-classification-ahecc/latest-release>

Lubricant Category	Percentage of PPS import volume (2021) <sup>18</sup>
Engine oil	30.07
Brake fluids	7.52
Gear oils	11.28
Transmission fluids	11.28
Hydraulic oils and fluids	11.28
Compressor oils	7.52
Refrigeration oils	7.52
Industrial process oils	0.75
Electrical insulating oil	3.76
Metalworking fluids and oils	1.50
Heat transfer oils	3.76
Machining oils	3.76
<b>Total</b>	<b>100</b>

### 6.3 Goldstar

No response was received from Goldstar following several attempts to obtain information.

### 6.4 Ott Transport

No response was received from Ott Transport following several attempts to obtain information.

### 6.5 Samoa Spare Parts & Accessories Co Ltd

Samoa Spare Parts is an automotive spare parts dealership and repair shop operated in Apia for over 40 years. The company imports 9 or 10 twenty-foot container loads of a wide range of packaged lubricants annually from America. This includes engine oil, brake fluids, gear oils, transmission fluids and hydraulic oils. The bulk of the lubricant imports are then sold to Asco Motors, Huanan Fisheries, Apia Concrete Products, Sakalafai (Savaii) and Myna’s Service Station. The company would support either a locally based used oil recycling facility or the export of used oil for recycling. The company currently is involved with the SRWMA used oil recycling programme in Samoa and deducts (charges) \$40 for the sale of each 55 gal (208lts) drum of oil to pay to SRWMA for collecting the resultant used oil from them (ie an advanced recycling fee of 20 Sene per lt).

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<sup>18</sup>PPS Data supplied 2022

*Table 7. Samoa oil import information (Samoa Spare Parts)*

Lubricant Category	Quantity imported 2021 (litres)
Engine Oil	79,763
Hydraulic fluids	19,002
Brake Fluid	869
Gear Oil	3,861
Automatic transmission fluid	4,259
Power Steering Fluid	1,113
Chain saw bar oil	454
Antifreeze	3,407
<b>Total</b>	<b>112,729</b>

## 6.6 Central Oil

Representatives from Central Oil provided annual import volumes of different lubricants into Samoa from The Recycling Company Pty Ltd, Australia (Table 8). There is no publicly available information about this Australian Company. Most of these imported lubricants are sold to Toleafoa Company Ltd, Bluebird Lumber and Hardware and Great Wall. The company supports the introduction of an advanced recycling fee so that the retailer doesn't have to cover this cost.

*Table 8. Samoa oil import information (Central Oil)*

Lubricant Category	Quantity imported 2021 (litres)
Engine Oil	2,000
Hydraulic fluids	2,000
Brake Fluid	2,000
Gear Oil	2,000
Automatic transmission fluid	2,000
Compressor oil	2,000
<b>Total</b>	<b>12,000</b>

## 6.7 Comparison with historic oil importation data

Oil importation data for 2011 by importer are compared with customs records for aggregated oil imports for the same importers between 2018-2021.

Table 9. Time comparison of Samoan oil imports (1,000lts)

Oil Importer	2011 <sup>19</sup>	2021
Goldstar	125	
Ott Transport	185	
PPS	72	400
Samoa Spare Parts	234	113
Other importers	43	24*
<b>TOTAL</b>	<b>660</b>	
<b>Customs Records Lubricating Oil Imports</b>	<b>594</b>	<b>667</b>

\*Data only available from Asco Motors and Central Oil

## 7.0 Used Oil Generation

*NB The sections below also cover a number of companies that also import small volumes of used oil as well as generate used oil.*

### 7.1.1 Estimates of used oil generated

Very little useful information has been able to be obtained about the quantity of used oil currently generated in Samoa. Customs information (Section 6.1 above) gave a figure of 667,000 Lts lubricating oil imported into Samoa in 2021, with a 4-year average of 740,000Lts. Past Pacific used oil audit reports have provided a “rule of thumb” that about 40-50% of lubricating oil added to engines ended up as used oil. Based on the 2021 figure, it could therefore be expected that 330,000-430,000 Lts of used oil is generated in Samoa per year. Until 2021, this used oil was essentially unmanaged.

### 7.1.2 Future used oil generation rates

A JICA survey carried out in 2021<sup>20</sup> estimated used oil generation rates in Samoa based on past surveys and then extrapolated these estimates out to 2030 (Table 10).

Table 10. Estimated used oil generation rates\*

	2014	2020	2030**
Used oil generation rate (lts per annum)		287 tonnes pa	410 tonnes pa
Used oil contained in		57 tonnes pa	82 tonnes pa

<sup>19</sup>Envirocare Engineering Consult Ltd (2013). *Cost Benefit Analysis of Used Oil Management Options for Samoa*. Unpublished Report to the Secretariat of the Pacific Environment Programme. 31 pp.

<sup>20</sup>JPRISM (2022). SRWMA Waste Oil Collection and Storage Pilot Project Implementation Report Phase 1. J-PRISM II (Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II)

EOL vehicles (lts)			
<b>Total used oil generated (lts pa)</b>	<b>250-270,000 lts</b>	<b>382,000 lts (344 tonnes pa)</b>	<b>547,000 lts (492 tonnes pa)</b>

Conversion rate of 0.9 kg per ltr of used oil

\*\*Based on expected annual national GDP increases

Utilising more recent data, an alternative estimate of used oil generation rates over the same time period in Samoa is presented in Table 11.

*Table 11. Estimated used oil generation rates for Samoa 2022-2030*

Year	GDP <sup>21,22</sup>	Averaged GDP (2009-2020)	Oil Imports (x1000lts)	Estimated Used oil generation (x1000lts) at 50% recovery	Estimate Used oil generation rate x1000lts (JICA) <sup>23</sup>	Cumulative used oil generation (x1000lts) 50% recovery
2010	2.55					
2011	4.17		594	297		
2012	-4.09		563	281		
2013	-0.42		469	235		
2014	0.05					
2015	4.30					
2016	8.13					
2017	1.04					
2018	-1.23		706	353		
2019	4.38		953	477		
2020	-2.59		709	355	382	
2021	-8.08		667	334		
2022	0.01		759	379		379
2023	4.02	1.43	769	385*		764
2024	4	1.43	780	390*		1,154
2025	3.51	1.43	791	396*		1,550
2026	3.01	1.43	802	401*		1,951
2027		1.43	813	407*		2,357
2028		1.43	825	412*		2,770
2029		1.43	836	418*		3,188
2030		1.43	848	424*	547	3,612

\*Estimated using GDP Predictions

<sup>21</sup><https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=WS>

<sup>22</sup><https://www.statista.com/statistics/728304/gross-domestic-product-gdp-growth-rate-in-samoa/>

<sup>23</sup>JPRISM (2022). SRWMA Waste Oil Collection and Storage Pilot Project Implementation Report Phase 1. J-PRISM II (Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II)

This estimate calculates that a total of 3,600,000 lts of used oil will be generated in Samoa by 2031 and needs to be managed. This assumes an average annual GDP for Samoa of 1.4%, based on historical data. This estimate is 20% lower than the JICA estimate derived in a slightly different manner. SPREP have confirmed that they also believe the JICA figure to be an over-estimation<sup>24</sup>. Any estimate of forward used oil generation rates is complicated by the lack of correlation between GDP and actual lubricant importation rates. The reality is that historically, GDP is essentially unconnected to actual quantities of lubricating oil imported ( $R^2 = 0.275$ ).

## 7.2 Mechanical Workshops

### 7.2.1 ASCO Motors (Lipa Vaoga)

- ASCO Motors is a Toyota dealership selling new and used vehicles and also a vehicle service centre. ASCO Motors are both an oil importer (21,600lts pa) and also a used oil generator (15,000lts pa).
- ASCO are major supporters of environmental projects including used oil management.
- Lubricating oil is sourced from Singapore (Yamalube gear oil) and Australia (ATF).
- Used oil from vehicle services is stored in an IBC for approximately a month before being collected by SWRWMA and transported to the landfill.
- ASCO pays 0.20 sene per litre disposal fee plus a transport cost of \$100 per used oil pick-up.
- Used oil filters are drained and returned to the customer as proof of service.
- There is no treatment of used oil on site and the IBC used for temporary used oil storage is not bunded. Any oil spills are contained with sawdust and disposed of to landfill.
- The dealership noted that the most common means of used oil disposal in Samoa was to mark sports fields.
- No oil management training has been received, and the dealership is not familiar with government regulations on oil management

### 7.2.2 Ford Hyundai Samoa

- No data was directly made available by Ford Hyundai Samoa.
- 51 drums (9,600lts) of used engine oil generated over an unknown time period was collected in August 2021 from Hyundai by SWOMP.
- No separation of different used lubricant types is carried out by Hyundai.

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<sup>24</sup>Director SPREP WMPC Division, pers comm 2022.

### 7.2.3 Nissan Samoa

- No data was directly made available by Nissan Samoa.
- 120 drums (23,000lts) of used engine oil generated over an unknown time period was collected in August 2021 from Nissan by SWOMP.
- No separation of different lubricant types is carried out by Nissan.
- Nissan Samoa is a foundation member of the Samoa Waste Oil Management Programme (SWOMP)

## 7.3 Construction and Haulage Companies

### 7.3.1 Lucky Construction Limited

- Lucky Construction is a local Civil and Structural Construction Company. It is also a supplier of building materials and heavy equipment hireage.
- The company generates two types of used oil: Engine oil (about 200 lts per month) and Hydraulic oil (about 600 lts per month).
- A circular steel tank is used to store the used oil, with other chemical fluids such as paint, petrol, and antifreeze stored separately away from used oil.
- The used lubricant storage area is not bunded (given the supposedly isolated location from the premises).
- About 800 litres of used oil has been stored for about a 3-year period, although most of the collected used oil is used as a lubricant for steel moulding for concrete pipes production.
- The company ensures that all machines are service regularly to prevent oil leakage and to minimize oil spillage
- Used oil filters are disposed of (stored) in used oil drums.
- The company is not aware of any government regulations for the management of used oil.
- The company is receptive to improved national used oil management initiatives, and would be willing to occur some cost to ensure that this happened.
- A national scheme would need to be resourced and appropriate training provided.

### 7.3.2 Lee Transport

- The company generates two types of used oil: Engine oil (about 20 lts per month) and Hydraulic oil (about 20 lts per month).

- An IBC is used to temporarily store the used oil at the Moata'a compound before it is reused for machinery fittings, mechanical services and maintenance of company trucks and machinery.
- The used lubricant storage area is not bunded.
- The company is receptive to improved national used oil management initiatives, and would be willing to collaborate with other used oil producers, particularly to collect bulk lots of used oil for local recycling.
- A national scheme would need to be resourced and appropriate training provided, including supply of additional IBCs for used oil storage.

### 7.3.3 Ott Construction

- Ott Construction generate around 3,800 Lts of used oil and 3,200 Lts of used hydrolyic oil per year which is stored temporarily in steel drums.
- They have 200 Lts of used oil currently stored on site.
- Used oil is disposed of to private land in Aleisa or used for marking sports playing field.
- The company is not prepared to pay for used oil management
- Have requested assistance with training and with the supply of used oil storage drums

### 7.3.4 Silva Transport

- Silva transport has been reported as collecting all marine oils in the past from the commercial fishing fleet.
- The collected used oil is stored in metal drums on site for up to 2 months.
- Basic training in oil spill management has been provide to staff by the Samoa Fire and Emergency Services Authority.
- Approximately 200lts of used oil is stored at any time.
- The used oil is disposed of by using it to paint the chassis of trucks to prevent them corroding
- SILVA has indicated that it is opposed to the introduction of an oil import levy to pay for the management of used oil as this is claimed to pose an unacceptable impost on consumers.
- The company has emphasized the need for government incentives on used oil management.

### 7.3.5 Ah Liki Construction



- Ah Liki Construction generate around 1,500 Lts of used oil and 1,000 Lts of used hydrolyic oil per year which is stored temporarily in steel drums contained in a bunded area.
- They have 400 Lts of used oil currently stored on site.
- Used oil filters are disposed of to land fill.
- The company is not prepared to pay for used oil management

### 7.3.6 Bluebird Transport and Construction

- Blue Bird Construction generates approximately 1200 lts of used oil per year and 600lts of used hydrolytic fluid per year.
- Used oil is stored in 200l drums. The storage area is not bunded.
- Stored used oil is used to lubricate machine parts. No used oil has been disposed of in any other way.
- Stored used oil is believed to be uncontaminated.
- There are approximately 100lts of used oil stored on site (this quantity does not change over time).
- Any oil spills are absorbed with sawdust.
- Used oil filters are disposed of at the landfill.
- Training and oil spill equipment would be appreciated.

## 7.4 Electricity Utility (EPC)

The Electric Power Corporation (EPC) is an autonomous government owned corporation responsible for the generation, transmission, distribution, and selling of electricity in Samoa. EPC plays a crucial role in the development of Samoa's economy and operates under the Energy Sector alongside other government bodies. EPC was reported as being one of the major used oil generators in Samoa in earlier analysis reports.<sup>25</sup>

- EPC generates used oil from diesel generator services.
- EPC has 4 storage tanks for used oil.
- Used oil is drained into a 20,000lt bladder and then pumped into bulk storage tanks.
- Used oil is uncontaminated by other sources.
- Used oil filters are either cleaned and reused or disposed of in the landfill.
- A bulk of the stored used oil has been stored for many years due to lack of disposal plans.

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<sup>25</sup>Envirocare Engineering Consult Ltd (2013). *Cost Benefit Analysis of Used Oil Management Options for Samoa*. Unpublished Report to the Secretariat of the Pacific Environment Programme. 31 pp.

- Used oil is given away to anyone who requests it.
- Small volumes of used oil are used by schools to mark sports fields and for protection of fence posts from termites.
- Used oil can also be used in the timber industry.
- Absorbent pads and saw dust used to contain any oil spillage.
- No training in oil spill response has been received and oil spill equipment is required.
- EPC is happy to collaborate in any government initiatives to dispose of used oil.

*Table 12. EPC Used oil data*

Location	Oil used per annum (lts)	Capacity (Lts)	Volume of stored used oil (lts) (August 2022)	Notes
EPC (Savaii)	205	25,000 (in 2 tanks)	10,000+	Bunded tank farm with fire fighting equipment
Fiaga Power Station	24,000	150,000	9,800	Bunded tank farm with fire fighting equipment
Tanugamanono Power Station	1,400	350,000	260,000	Bunded tank farm with fire fighting equipment

## 7.5 Marine and Port Operations

Samoa Ports Authority (SPA) was established to operate as a self-funding, commercially viable organization to ensure safety of ports and maritime operations and has been in operation since 1999.

- Private contractors are hired by SPA to dispose any oil that enter the Samoa port. It is understood that septic pump out trucks are used for this purpose.
- An unknown volume is disposed of by these private contractors (for ships).
- (Past) practices have included pump out used oil from ships with sludge and liquid waste and disposal in designated sludge ponds at *Tafaigata* Landfill.

## 7.6 Other

### 7.6.1 Vailima Brewery

- No data was directly made available by Vailima Brewery.

- 40 drums and smaller container (8,000lts) of used oil generated over an unknown period was collected in August 2021 by SWOMP.
- The collected oil was mixed and included gear oil, hydraulic fluid and compressor lubricants.

## 8.0 Used Oil Management

### 8.1 Used Oil Storage Facilities

A majority of used oil generators store used oil in steel drums and IBCs supplied by the GEFPAS Programme in 2019. Storage containers are not contained in bunded areas, and no training is known to have been provided in oil spill response and clean-up. One used oil generator reported using sawdust as an oil absorbent, but no information was provided on how the contaminated sawdust was disposed of. The SWOMP newly built storage facility also saw evidence of sawdust used- scattered on to oil spillages however disposal of contaminants was not made known (Figure 1).



*Figure 1. Contaminated sawdust on previously spilled oil stockpiles at SWOMP Facility.*

### 8.2 Used Oil Disposal Practices

Stakeholders have advised that used oil is often used for machinery servicing and as a lubricant in construction activities including steel moulding and for concrete pipe production.

The Samoa Recycling and Waste Management Association (SRWMA) and JPRISM have jointly completed Phase 1 of the SWOMP pilot project on waste oil collection and

storage. Phase 1 was carried out to acquire and analyze basic data connected with waste oil collection and storage. Approximately 60,000 Lts of used oil has been collected and stored at the *SRWMA (SWOMP) Storage Facility* to date under the programme.

A recycling fee of 0.20 Sene is charged per litre of collected oil along with a transportation fee of \$100 per 1000 Lts of oil collected.

Phase 2 of SWOMP will continue for another 5 months in 2022 and be used to analyse the implementation results of Phase 1, assess efficacy of used oil collection methods, and identify additional equipment necessary for collection. A cost benefit analysis including a review the collection charge will also be completed under Phase 2 of SWOMP.



*Figure 2. Uncovered and weathered storage of Used Oil at the SWOMP /SRWMA Facility.*



*Figure 3. Storage inside of SWOMP facility. Visible black staining on flooring from spills.*

### 8.3 Used Oil Export Practices

No used oil has been exported from Samoa to date (2022). A critical component of the feasibility study will be the identification of a (any) viable export destination(s) for the used oil.

## 9.0 Known Government and Stakeholder Priorities

### 9.1 Samoa Recycling and Waste Management Association (SRWMA)

The Samoa Recycling and Waste Management Association (SRWMA) was the first recycling association established in the Pacific Island Countries in 2018. SRWMA is a private NPO with members such as local recyclers, manufacturers, and universities.

- The Samoa Waste Oil Management Plan (SWOMP) was launched in 2019 by SRWMA.
- A one-day training in used oil collection and storage was held in August 2019
- Used oil collection and storage facilities at the *SRWMA (SWOMP) Storage Site* were complete in February 2021.
- Currently have in possession 50-60,000litres of used oil stored at the landfill with no immediate options for export.
- SRWMA currently have many challenges including a lack of technical capacity within the association to deal with oil management.
- SRWMA supports the introduction of a Deposit Levy mechanism.

### 9.2 Samoa Chamber of Commerce

The role of the Samoa's Chamber of Commerce is to advocate, facilitate and promote the development of Samoa's private sector at the national, regional and international levels.

- The Chamber of Commerce strongly opposed the idea of an advanced used oil recycling levy.
- The Chamber believe that this will penalize and add further pressure on the private sector/importer and should not be the solution to used oil management in Samoa.
- The Chamber also believed that introduction of a levy will result in illegal disposal of used oil.<sup>26</sup>
- The Chamber claims that Samoa already has too many policies and laws and there is poor enforcement of this existing laws.

### 9.3 Samoa Government Priorities<sup>27</sup>

Early inception meeting discussion with Samoan Government staff have indicated that:

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<sup>26</sup>This concern suggest that the Chamber may have mis- understanding how a levee, in principal, would work

<sup>27</sup>Pers Comm (2022) Seumalo Afele Failagi, Setoa Apo and Fiasoso Siasoi, MNRE

- The Samoan government doesn't have a used oil management policy
- Used oil is currently managed under the Waste Management Act (2010)
- Strengthening of regulatory frameworks are a government priority to improve used oil management
- Appropriate collection and storage mechanisms are essential if used oil is to be managed correctly
- Used oil management in Samoa has been delayed by a lack of funding and appropriate levels of human resources
- Appropriate data collection and education programmes for the industry and general public will also be required
- Costs could be potentially recovered through an advanced recycling fee (ARFD) that is also being considered for other waste streams
- MNRE are happy to assist in provision of used oil management data

#### 9.4 Other Stakeholders

- Stakeholders have advised that they support the management of used oil to prevent adverse environmental impacts.
- However, used oil stakeholders have also indicated via the Chamber of Commerce that they strongly oppose the introduction of a tariff to pay for the disposal of used oil.
- SRWMA have indicated that charging (0.20 sene) is not a feasible option in Samoa as it does not cover costs and would need to be at least doubled.
- Used oil generators have indicated that training and equipment is needed in the industry to ensure that used oil can be collected and stored correctly.
- Used oil generators have also indicated that they would be happy to be involved in a national used oil collection scheme (if it free).



## 10.0 Analysis of Findings

### 10.1 Existing legislation is adequate for the management of used oil in Samoa.

Management of used oil (as a hazardous waste) by MNRE in Samoa would be carried out under Section 4 of the Samoan Waste Management Act (2010). The functions and responsibilities of the Ministry under the Act include:

- Preparation, adoption and enforcement of rules, operating manuals, codes of practice and standards regulating activities associated with the management of waste in Samoa (Section 4k); and
- Formulation, implementation and enforcement of policies, programs, initiatives, standards and requirements to reduce the generation of waste (Section 4o).

### 10.2 New Regulations would need to be written and introduced for used oil management

Under the Act (2010), the Head of State (acting on the advice of Cabinet), may make Regulations for the proper management and regulation of used oil (as a hazardous waste) in Samoa and for the management and operation of approved used oil management operators (Section 43(1)). Regulations may (and would need to be made which) specify toxic and hazardous waste and regulate the way such waste may be stored, transported and disposed of (Section 43(2)). Regulations governing the transportation of bulk used oil from collection points to bulk storage or to point of use must also be regulated to ensure best environmental practice. This would consider issues such as:

- All vehicles and drivers used in the collection of used oil must comply with all Transport Authority registration and licensing requirements (including certification and training);
- Transportation of used oil in suitable, covered containers;
- Appropriate labeling of transport containers; and
- Access to suitable accidental spill containment equipment and personal protective equipment.

### 10.3 Advanced Disposal Fee Levy regulated and enforced

Levies to pay for used oil management would need to be introduced. The Head of State (acting on the advice of Cabinet) may make Regulations which impose special levies on particular goods which have adverse effects on the environment, or for the purpose of raising revenues for the effective management of waste (Section 10).

## 10.4 Improved used oil management

Improved national used oil management will also require:

- Improved bulk storage of collected used oil. Some progress has been made in the storage of used oil through the distribution of 100 free IBCs to the SRWMA and used oil generators and the commencement of a limited fee for service used oil collection trial at the *SRWMA (SWOMP) Storage Facility*. Waste Oil collected under the SWOMP Project administered under the JPRISM Project is openly exposed to sunlight at the SRWMA Recycling compound and clearly needs heavily bunded storage area. A fire was reported to have burnt parts of the area where the aforementioned oil is currently being stored however was quickly dealt with. This was reportedly due to some hazardous material being collected presumably as oil and spilled on the nearby grounds. Data management improvement also needs addressing.
- Improved data collection connected with lubricant importation and used oil generation rates. This could be achieved as a component of used oil regulations.
- An Industry education programme on best practice used oil management.
- A public education programme on best practice used oil management.
- Stakeholder training and equipment for used oil management in Samoa.

## 10.5 Export of used oil for recycling

No export of used oil has taken place from Samoa to date (September 2022). All used oil is either stored, used in industrial processes or likely used for other purposes such as sport field line marking. It is critical that suitable overseas recycling destination(s) are identified and that their cost benefit evaluated prior to a preferred destination and facility being selected for export of used oil from Samoa.

## 11.0 Conclusions

- Used oil management has not progressed significantly in Samoa over the last 10 years.
- An unknown quantity of used oil is still used for playing field marking and for local reuse in machinery maintenance and servicing and in construction practices.
- No export of used oil has taken place from Samoa to date (September 2022).
- Outcomes proposed in previous strategies, policies and cost-benefit analysis have not been adopted by government or widely by stakeholders.
- Some progress has been made in the storage of used oil through the free distribution of IBCs to the SRWMA and to used oil generators and the commencement of a limited fee for service used oil collection trial at the *SRWMA (SWOMP) Storage Facility*.
- Imports of lubricants are recorded by Customs, but oil imports are only recorded in three ambiguous product tariff lines (categories).
- There is no formal collection of used oil generation rate data and there is no accurate data available on the total quantities of stored used oil in Samoa. It is estimated that 350,000 lts of used oil is currently stored in Samoa.
- It is estimated that used oil production will increase over time, although estimates are inconclusive as there has been little past correlation with lubricant importation rates and national GDP data.
- A majority of stakeholders including the Chamber of Commerce still remain firmly opposed to the introduction of any form of advanced recycling tariff on imported oil products largely due to the major increase of imported goods in most recent years.
- MNRE has the legislative power to introduce national used oil management regulations and structures but have not acted on this.
- Stakeholders indicated the need for public education programmes to improve national used oil management practices.
- Stakeholders also highlighted the need for and training and additional (unspecified) equipment for used oil management in Samoa.
- The current AFD project should continue to liaise closely with the JICA/SWOMP programme given the similarity in programme objectives.

## 12.0 The Feasibility Study

As per the contract, the Feasibility Study needs to address:

- a) Products to be included in the Used Oil Management Plan
- b) Sectors to be serviced by the Used Oil Management Plan
- c) Recommendations for options on how to best deliver the Used Oil Management Plan and services
- d) Identification and specifications of any equipment and materials required for the establishment of used oil collection, storage, treatment and disposal stations, including cost estimates.
- e) Assessment of the capacity-building needs of government and the oil and waste industry to effect the implementation and operation of the proposed Used Oil Management Plan.
- f) Identification of the system data capture and monitoring necessary to effectively manage service contracts, report to the community, and assist the country to report on its obligations under international conventions (monitoring system details, including any technological requirements, should be detailed).
- g) Provision of recommendations for national engagement and education of the oil / used oil sector and community to assist with the implementation and success of the National Used Oil Management Plan.

There are clear gaps in the information gathered at the Analysis Report stage and described above. It is believed, however, that these gaps can be filled at the Feasibility Study stage and that there is now enough information to move to this stage.

Important inputs into this stage will be:

- The entry into the market of a new major fuel, oil and related products supplier, Total Energies Fiji.
- The report prepared by MRA Consulting Group for SPREP/ADF on Technology Options for Used Oil.<sup>28</sup>
- The upcoming used oil SWAP pilot project whose activities include piloting proper storage of used oil from major waste generators by constructing a proper storage facility, monitoring of activities, awareness & education, and training of staff in-country. In Samoa this pilot study is awaiting the outcome of the Feasibility Study.
- Analysis of the options for exporting used oil from Pacific countries to other countries where it can be properly reused. This needs to include consideration of costs and carbon footprint. This analysis will be conducted by Consultant Team member Boyne Drummond.

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<sup>28</sup>SPREP (2022). Used Oil Management Technology Options Report. MRA Consulting Group

- Assessment of the potential for imposing an Advanced Disposal Fee on imported lubricating oil. This analysis will be conducted by Consultant Team member Alice Leney.

## Appendix 1: List of Stakeholder Questions

### 1. National Government

- What are the government priorities for national used oil management?
- Is there a Government Policy on used oil management?
- What are the regulatory considerations for used oil management?
- What is the current government capacity to manage used oil and what assistance is needed?
- What are the government responsibilities for used oil management?
- Who are the National used oil management stakeholders?
- How would used oil carriers be licenced?
- How would used oil storage facilities be licenced?
- Who would train used oil handlers/carriers?
- How would the government set up and manage an advanced recycling fee for used oil management?
- What sort of monitoring and evaluation programme would be required?
- How would International Convention requirements be managed and what, if any, additional assistance would be required by Government to ensure requirements were met?
- Is improved community education needed? (What is done now)?
- Is improved data collection needed? (What is done now)?

### 2. Customs

- What volume of different oil (lubricant) types (litres/kg) is imported annually into Vanuatu (2018-2021)?
- What categories of lubrication oils are separated out in Customs records?
- Are they reported in kg or lts?
- Is this data available for 2018-2021 inclusive?
- Could the data be supplied in an electronic spreadsheet?

### 3. Oil Importers

- If not commercial in confidence, what volume of different oil types (litres) is imported annually into Vanuatu (2018-2021)?
  - Engine oil
  - Brake fluids
  - Gear oils
  - Transmission fluids
  - Hydraulic oils and fluids
  - Compressor oils
  - Refrigeration oils
  - Industrial process oils
  - Electrical insulating oil (Care must be taken to exclude oil likely to contain PCBs)
  - Metalworking fluids and oils
  - Heat transfer oils
  - Machining oils
- Who are the lubricants sold to and in what annual quantities (ie who are the end users)?
- Where are the different lubricating oils sourced from (ie Singapore, USA, Aust, NZ etc)?

#### **4. Oil Retailers**

- What volume of each oil type is sold annually?
- What are the major user groups and volumes purchased?
  - Power generation (EPC)
  - Shipping
  - Construction companies
  - Bus and haulage operators
  - Car fleets (including service stations and taxis)
- How are the different oil types retailed (in what volume and in what type of container)?
- Do you have a take back scheme for used oil and/or oil containers?
- What % of oil (what annual volume) is sold to customers for home DIY oil changes?

#### **5. Used oil generators**

- What volume of each used oil type is generated annually at your business?
- How is the used oil collected and stored (ie drums, IBCs, bulk storage etc)?
- Please specify the short term storage type and capacity, long term storage type and capacity, how long is the used oil is usually stored for before disposal?
- How are other chemicals (petrol, paint, antifreeze) stopped from contaminating the used oil?
- How much used oil is currently stored on site (and how long approximately has it been stored for)?
- How are used oil filters managed?
- How have you disposed of used oil in the past?
- What is the cost to dispose of the used oil?
- How is the used oil disposed of now?
- Are there any other (unsatisfactory) oil disposal practices still carried out and what might be required to prevent this in the future?
- Is there any treatment of the used oil on site (eg water separation....)?
- How are oil spills managed?
- Is there any training in oil spill management?
- Are storage areas bunded?
- Is there any practical use for used oil in Vanuatu?
- Are there any options for a local recycling oil processing plant for Vanuatu?
- What government regulations are in place for used for used oil management?
- What is the stakeholders priority actions for a national used oil management scheme?
- What can the used oil generator commit to doing under a national used oil management scheme?
- What assistance is required (training, funding, equipment) to enable this to occur?

#### **6. Car Registration**

- How many registered cars in Vanuatu (private and commercial users)?
- How many registered trucks (private and commercial users)?
- How many registered buses (private and commercial users)?

#### **7. Used oil Transporters**

- Annual used oil volumes transported per year?
- Major sources of used oil transported by the carrier?
- Transport container and truck description?
- Details of spill response equipment and training?
- Details of national licence/certification for used oil transport?
- Logistical issues connected with used oil transportation?
- What is the stakeholders priority action for a national used oil management scheme?
- What can the used oil transporter commit to doing in the scheme?
- What assistance is required to enable this to occur?

#### **8. Marine**

- How is used oil from boats managed?
- How much used oil from boats is disposed of on shore per year
- How is collection, transport and disposal managed?
- What are the costs incurred/charged

#### **9. Used oil storers**

- Landfill has storage capacity?
- Is there storage capacity elsewhere?
- What are the quantities of each existing stockpile of used oil?
- How is the used oil received and stored?
- What is the annual acceptance rate of used oil at the site?
- How is this financed?
- How is the collected used oil disposed of?
- What are some safety measures put in place for the above storage facilities? Are there any OHS tools applied?
- It there spill equipment, training etc at the site?

#### **10. Used oil exporters (SWIRE, Matson, NPDL, Pacific Forum Line)**

- What are the export destination options for used oil recycling (eg Fiji BlueScope Steel, New Zealand, Australia, India, Saudi Arabia, South Korea etc)?
- What volume of used oil is exported annually?
- How frequently is the oil shipped?
- Where is the used oil sourced from?
- What containers/systems are used to ship the oil?
- How much does it cost to export the used oil?
- How much is the used oil sold for?
- What International Conventions are used to ship the used oil?
- Is training in international conventions procedures needed?
- Any specific logistical issues?
- OHS issues and training required or currently carried out?
- Site bunding and spill response planning details?

#### **11. Export destination**

- Which destination?
- What is known about how the used oil will be managed in the receiving country?



- How much has been exported to the destination over the last 3 years?
- What were the financial details of the export?
- International Convention requirements and training required?
- Cost recovery system details?
- Which Shipping Lines are currently involved in shipping used oil from Samoa

## Appendix 2: Organisations and Personnel Interviewed

Organisation	Organisation Role	Interviewee
ASCO Motors	Motor service centre	Lipa Vaoga
Bluebird	Transport/Construction	Zan Westerlund
Chamber of Commerce	Business Collective	Hobart Vaai
Customs	Regulator	Rodney Lui
EPC	Power Utility	
Ford	Motor Service Centre	
Goldstar	Oil importer	Willie Rasmussen
JICA	Foreign Aid	Yoko
Lee Transport	Transport	
Lucky Construction	Construction	Asalemo
MNRE	Government Regulator	Fiasoso Siaosi
Nissan/Hyundi	Motor Service Centre	
Ott Transport	Transport	
PPS	Oil importer	Sozein Koppel and Ulisese Vaoga
Samoa Shipping	Used oil generator	
Samoa Spare Parts	Oil Importer	
Silva Transport	Transport/Construction	
SPA	Port Authority	Toilolo Silalomanu
SRWMA	Recycling collective	Marina Keil



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