The detection limit for the analytes was determined by QHFSS based on its current analytical capability. This may vary from the compliance limits established for the substances.

5. Results and Discussion

The 17 samples were analyzed for nicotine and other substances of concern such as carbonyl compounds, VOCs, pesticides, and heavy metals, and eight substances that are prohibited ingredients in vapes under the TGO 110.

E-liquids are also known to contain other chemical additives (flavourings and preservatives) and contaminants that have the potential to pose a serious health risk to vape users. These chemical additives and contaminants typically include various carbonyl compounds, VOCs, and heavy metals.

The results of the 17 samples are discussed below.

5.1 Nicotine

Nicotine was found in all e-liquid samples, as shown in Table 1. The nicotine content ranged from trace levels (<200 mg/kg) to 47,000 mg/kg.

Under Queensland's *Medicines and Poisons Act 2019*, vaping devices containing nicotine may only be obtained at a pharmacy under the prescription of a medical practitioner. Such devices may contain up to 100 mg/ml (100,000 mg/kg) of nicotine. Vaping products which contain nicotine and are sourced from other retailers are illegal under the *Medicines and Poisons Act 2019*. As these samples were NOT obtained through a pharmacy via a prescription, **nicotine should not have been present in any samples.**

The capacity of e-cigarettes to deliver nicotine and other harmful chemicals into the body varies widely, ranging from very low to levels like that of cigarettes, depending on product characteristics, user inhalation behaviour, and nicotine solution concentration.

The health risks of nicotine include neurological, cardiovascular, respiratory (impaired lung function), renal, and reproductive health effects. In some cases, high levels of exposure can lead to death. Young children, adolescents, pregnant and breastfeeding mothers, and the elderly are considered the most vulnerable to nicotine exposure. According to the World Health Organisation, nicotine itself is not a carcinogen, however, it may function as a "tumor promoter". Nicotine seems involved in fundamental aspects of the biology of malignant diseases, and neurodegeneration.

4.2 Prohibited ingredients

There are eight chemical compounds listed as prohibited ingredients under the TGO 110. These include 2,3-pentanedione, acetoin, benzaldehyde, cinnamaldehyde, diacetyl, diethylene glycol, dl-alpha-tocopheryl acetate (Vit E), and ethylene glycol. The compliance limit set under the TGO 110 is less than 10 parts per million (ppm).

The laboratory analysis in **Table 2** revealed that none of the seventeen (17) samples contained prohibited ingredients above the laboratory limit of reporting (LoR) or limit of detection of 2000ppm. This limit is significantly higher (x200) than the compliance limit set under the TGO 110.

Further analysis would need to be undertaken to ascertain that the samples do not contain prohibited ingredients above the detection limit set under TGO 110.

It should be noted that using a different analytical method, which is used to assess carbonyls, benzaldehyde (carbonyl) was detected in two of the samples, at 28ppm and 66ppm (note 1 mg/kg = 1ppm). Benzaldehyde is a prohibited ingredient under TGO 110 with a compliance limit of <10 ppm, set by TGO 110.

There are known health risks associated with inhaling these prohibited ingredients identified in the TGO 110. These include irreversible lung damage; respiratory failure; toxicity of the brain, heart, and kidneys; and impairment of the immune cell function.

Table 1 - Nicotine

Lab Analysis (Limit of Reporting: 200 mg/kg)	IGET Bar Strawberry Watermelon Ice	Vorteke Melon	IGET Bar Strawberry Lemon Ice	IGET Legend Passionfruit Watermelon Ice	IGET Bar Grape Ice	IGET Bar Kiwi Pineapple Ice	IGET Legend Blueberry Blackberry Ice	HQD Cuvie Plus - Strawberry Watermelon	HQD Cuvie Plus – Passionfruit
Nicotine	Present	Present	Present	Present	Present	Present	Present	Present	Present
Concentration (mg/kg)	43,000	<200	45,000	47,000	47,000	45,000	44,000	38,000	44,000

Lab Analysis (Limit of Reporting: 200 mg/kg)	IGET Bar - Peach Ice - 3500 puffs	IGET Bar - Blackberry Ice - 3500 puffs	IGET XXL - Lush Ice - 1800 puffs	IGET Goat - Cherry Ice - 5000 puffs	Gunnpod Meta - Gra Ice - 4500 puffs	Gunnpod Wave - Su Breeze - 3500 pu	IGET Mega - Strawberry Banana Ice - 3000 puffs	Waka Smash - Apple surge - 6000 puffs
Nicotine	Present	Present	Present	Present	Present	Present	Present	Present
Concentration (mg/kg)	37,000	33,000	<200	28,000	30,000	12,000	35,000	30,000

Table 2 – Prohibited substances under TGO 110

Vaping liquid Samples tested (Limit of Reporting 2000mg/kg except for Vitamin E acetate 50 mg/kg))	TGO110 - Prohibited Substances							
	2,4-Butadione	2,3-Pentadione	Acetoin	Benzaldehyde	Cinnamaldehyde	Vitamin E acetate	Ethylene glycol	Diethylene glycol
IGET Bar Strawberry Watermelon Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
Vorteke Melon	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar Strawberry Lemon Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Legend Passionfruit Watermelon Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar Grape Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar Kiwi Pineapple Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Legend Blueberry Blackberry Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
HQD Cuvie Plus - Strawberry Watermelon	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
HQD Cuvie Plus – Passionfruit	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar - Peach Ice - 3500 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar - Blackberry Ice - 3500 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET XXL - Lush Ice - 1800 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Goat - Cherry Ice - 5000 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
Gunnpod Meta - Grape Ice - 4500 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
Gunnpod Wave - Summer Breeze - 3500 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Mega - Strawberry Banana Ice - 3000 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
Waka Smash - Apple surge - 6000 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR

5.3 Other Chemicals of Concern

5.3.1 Carbonyl compounds

All 17 samples of e-liquids were found to contain carbonyl compounds. All samples contained at least two carbonyl compounds (formaldehyde and acetaldehyde) and 16 samples contained acrolein.

Carbonyl compounds are considered irritants of the mucosal tissue of the lungs. Some of these compounds are potentially harmful to health. For example, formaldehyde is classified as a Group 1 human carcinogen by the International Agency for Research on Cancer, and acetaldehyde is classified as possibly carcinogenic to humans (Group 2B); while acrolein causes irritation of the nasal cavity and damages the lining of the lungs.

5.3.2 Volatile Organic Compounds

VOCs are a class of organic compound chemicals (usually found in gaseous form) that are typically used and produced in the manufacture of paints, pharmaceuticals, and refrigerants.

All 17 samples contained various VOCs. Five VOCs are common to all 17 samples: propylene glycol, glycerin, 2-isopropyl-N,2,3-trimethylbutanamide, benzoic acid, and 3-hexene-1-ol.

Propylene glycol and glycerin are the main components of e-liquids. They are known to be hazardous when inhaled. Heating propylene glycol and glycerin in e-cigarettes produces lung disease hazards and inhaling these compounds makes the lungs vulnerable to infections. Breathing aerosolised propylene glycol can affect the risk of asthma development.

While some of the VOCs detected are not known to pose health risks, many of these have been flagged for critical health concerns. For example, methyl anthranilate (found in three products) and ethyl propanoate (found in one product) are suspected carcinogens and either a mutagen, skin sensitiser or toxic to reproduction. Further, neomenthol (found in 7 products) and ethyl lactate have also been suspected to be toxic to reproduction.

5.3.3 Heavy Metals

All samples contained between five to fifteen heavy metals. Arsenic and zinc were detected in all samples. Other toxic heavy metals identified include lead, mercury, nickel, chromium, antimony, aluminium, iron, nickel, barium, manganese, copper, strontium, and vanadium.

A number of these heavy metals are known to be carcinogenic, mutagenic, toxic to reproduction and development, and cause neurological anomalies. Arsenic and nickel are carcinogens, while chromium and nickel are linked to respiratory diseases. Manganese, lead, and mercury are known to cause neurological and developmental defects. Barium may cause kidney problems, while vanadium may be toxic to the respiratory system.

6. Summary of Results

Several chemical compounds detected in e-liquids tested as part of this analysis have been reported to pose serious health risks to vape users. The analysis identified that:

- All 17 samples of e-liquid products analysed contained nicotine. The nicotine content ranged from trace levels (<200 mg/kg) to 47,000 mg/kg.

- None of the 17 samples analysed recorded prohibited ingredients above the laboratory detection limit of 2000 ppm. The detection limit employed by QHFSS is significantly higher (x 200) than the compliance limit set under the TGO 110 which is less than 10 ppm.
- Using a different analysis method, benzaldehyde, which is a prohibited ingredient under TGO 110, was detected in two of the samples, at 28ppm and 66ppm which is above the limit set by TGO 110 (<10 ppm).
- All 17 samples contained various VOCs. Five (5) VOCs are common to all 17 samples.
- All samples contained between five 5 to 15 heavy metals. A number of these heavy metals are considered toxic when inhaled including arsenic and zinc, which were detected in all samples.

David W

From: Jim s.73 - Irrelevant information
Sent: Thursday, 18 May 2023 9:17 AM
To: David W
Subject: FW: Amended reports for e-cigarette fluids
Attachments: SSP83249_QH_EnvHazUnit_NicotineTGAPestMetals_Amended.pdf; SSP83440_QH_EnvCommittee_Report_Amended.pdf

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From: David P s.73 - Irrelevant information health.qld.gov.au>
Sent: Wednesday, 17 May 2023 3:53 PM
To: Jim s.73 - Irrelevant information s.73 - Irrelevant information health.qld.gov.au>; Ri s.73 - Irrelevant information s.73 - Irrelevant information @health.qld.gov.au>
Subject: Amended reports for e-cigarette fluids

G'day Jim, R s.73 - Irrelevan

Apologies for this but the reports have come back from peer review with some errors. Due to the urgent turnaround I submitted these prior to peer review, usually this just brings up typos but this time it has shown there were transcription errors as well.

These are:

- A cut and paste issue with the aldehydes in both SSP83249 and SSP83440 – acetone was missing from the word document so the lines are out of step with the excel data
- Errors were made in inputting nicotine fluid masses into the calculation spreadsheet for nicotine calculations for SSP83440

Many apologies for this. This is the first time I've run series of tests for the e-fluids and there's a lot of manual handling. Future transcriptions will be done by VBA macros and will eliminate these types of problems.

David

David P
Senior Chemist

Organics Laboratory

Forensic and Scientific Services
Prevention Division Queensland Health

p s.73 - Irrelevant information
a 39 Kessels Road Coopers Plains Qld 4108
e s.73 - Irrelevant information health.qld.gov.au w **www.health.qld.gov.au/fss**

Queensland Health acknowledges the Traditional Owners of the land, and pays respect to Elders past, present and emerging.

Queensland Government

Forensic and Scientific Services

AMENDED CERTIFICATE OF ANALYSIS

CLIENT: QH – Environmental Hazards Unit
16 Butterfield St

HERSTON QLD 4006

ATTN: Jim [redacted]

CC:

Laboratory Reference	: SSP83249
Client Order Number	: n/a
Quote Number	: n/a
Client Project	: n/a
Client Batch Reference	: n/a
Date Received	: 13-Apr-2023
Date Commenced	: 13-Apr-2023
Laboratory Number/s	: 23KS870-879

Submitting Authority : Queensland Health Environmental Hazards unit

Number of Samples : Ten (10) e-cigarette devices

Reason for Analysis : Quantitation of nicotine
Quantitation of compounds outlined in Subsection 7(3) Schedule 1 of the TGA document TGO 110
Quantitation of carbonyl compounds
Pesticide/Herbicide Screens
Heavy metals screen

Method/s of Analysis : QIS34310 – Nicotine Analysis

QIS15506 - Qualitative and/or Quantitative Analysis using Liquid Chromatography Separation with Mass Spectrometer Detection

QIS12659 - Determination of Trace Elements in Foods by ICP-MS after Microwave Digestion

QIS12792 – Analysis of drugs by classical (Pharmacopeia), GC, GCMS, HPLC, UV/VIS HPLC/MS methods

Remarks : Sample details and results are summarised in Tables 1 - 6

s.73 - Irrelevant information

David P [redacted]
Senior Chemist, Organics Laboratory
17th May 2023

Enquiries David P
Phone s.73 - Irrelevant infs.73 - Irrelevant
Email [redacted]@health.qld.gov.au

39 Kessels Road
Coopers Plains QLD 4108
AUSTRALIA

PO Box 594
Archerfield QLD 4108
AUSTRALIA

Phone (+61 7) s.73 - Irrelevant informa
Fax (+61 7) [redacted]
Email s.73 - Irr [redacted]@health.qld.gov.au

CERTIFICATE OF ANALYSIS

Laboratory Reference: SSP83249
Laboratory Number: 23KS870-879

Table 1: Nicotine Results for SSP83249

Lab No.	Sample Reference	Sample Description	Results (mg/kg)
23KS870	22KS5561	HQD Cuvie Plus - Strawberry Watermelon	**38000**
23KS871	22KS5570	HQD Cuvie Plus - Passionfruit	**44000**
23KS872	22KS6288	IGET Bar - Peach Ice - 3500 puffs	**37000**
23KS873	22KS6292	IGET Bar - Blackberry Ice - 3500 puffs	**33000**
23KS874	22KS6328	IGET XXL - Lush Ice - 1800 puffs	< LOR
23KS875	23KS297	IGET Goat - Cherry Ice - 5000 puffs	**28000**
23KS876	23KS298	Gunnpod Meta - Grape Ice - 4500 puffs	**30000**
23KS877	23KS299	Gunnpod Wave - Summer Breeze - 3500 puffs	**12000**
23KS878	23KS301	IGET Mega - Strawberry Banana Ice - 3000 puffs	**35000**
23KS879	23KS313	Waka Smash - Apple surge - 6000 puffs	**30000**

Limit of Reporting (< LOR) – 200 mg/kg

CERTIFICATE OF ANALYSIS

Laboratory Reference: SSP83249
Laboratory Number: 23KS870-879

Table 2: Carbonyl results for SSP83249

Client Reference				22KS5561	22KS5570	22KS6288	22KS6292	22KS6328
Sample Type				liquid	liquid	liquid	liquid	liquid
Sampling Time / Date				n/a	n/a	n/a	n/a	n/a
Sample Description				HQD Cuvie Plus - Strawberry Watermelon	HQD Cuvie Plus - Passionfruit	IGET Bar - Peach Ice - 3500 puffs	IGET Bar - Blackberry Ice - 3500 puffs	IGET XXL - Lush Ice - 1800 puffs
Method	Analysis for drugs by GCMS	Units	Reporting Limit	23KS870	23KS871	23KS872	23KS873	23KS874
12792	Formaldehyde	mg/kg	20	220*	160	210	120	180
12792	Acetaldehyde	mg/kg	20	190	200	32	31	46
12792	Acetone	mg/kg	20	35	36	21	20	25
12792	Acrolein	mg/kg	20	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Propionaldehyde	mg/kg	20	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Hexaldehyde	mg/kg	20	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Benzaldehyde	mg/kg	20	66	29	70	< LOR	< LOR
12792	p-Tolualdehyde	mg/kg	20	< LOR	< LOR	< LOR	< LOR	< LOR

Table 2: Carbonyl results for SSP83249 (con't)

Client Reference				23KS297	23KS298	23KS299	23KS301	23KS313
Sample Type				liquid	liquid	liquid	liquid	liquid
Sampling Time / Date				n/a	n/a	n/a	n/a	n/a
Sample Description				IGET Goat - Cherry Ice - 5000 puffs	Gunnpod Meta - Grape Ice - 4500 puffs	Gunnpod Wave - Summer Breeze - 3500 puffs	IGET Mega - Strawberry Banana Ice - 3000 puffs	Waka Smash - Apple surge - 6000 puffs
Method	Analysis for drugs by GCMS	Units	Reporting Limit	23KS875	23KS876	23KS877	23KS878	23KS879
12792	Formaldehyde	mg/kg	20	130	190	140	380*	130
12792	Acetaldehyde	mg/kg	20	26	110	120	250	70
12792	Acetone	mg/kg	20	< LOR	44	49	37	48
12792	Acrolein	mg/kg	20	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Propionaldehyde	mg/kg	20	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Hexaldehyde	mg/kg	20	< LOR	< LOR	28	< LOR	66
12792	Benzaldehyde	mg/kg	20	680*	67	< LOR	76	< LOR
12792	p-Tolualdehyde	mg/kg	20	< LOR	< LOR	< LOR	< LOR	< LOR

* Above top calibration standard – estimate only

CERTIFICATE OF ANALYSIS

Laboratory Reference: SSP83249
Laboratory Number: 23KS870-879

Table 3: Results for TGO 110 compounds

Client Reference				22KS5561	22KS5570	22KS6288	22KS6292	22KS6328
Sample Type				liquid	liquid	liquid	liquid	liquid
Sampling Time / Date				n/a	n/a	n/a	n/a	n/a
Sample Description				HQD Cuvie Plus - Strawberry Watermelon	HQD Cuvie Plus - Passionfruit	IGET Bar - Peach Ice - 3500 puffs	IGET Bar - Blackberry Ice - 3500 puffs	IGET XXL - Lush Ice - 1800 puffs
Method	Analysis for drugs by GCMS	Units	Reporting Limit	23KS870	23KS871	23KS872	23KS873	23KS874
12792	Butyraldehyde	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	2,4-Butadione	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	2,3-Pentadione	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Acetoin	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Benzaldehyde	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Tolualdehyde	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Cinnamaldehyde	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
15506*	**Vitamin E acetate**	mg/kg	50	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Ethylene glycol	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Diethylene glycol	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR

Table 3: Results for TGO 110 compounds (con't)

Client Reference				23KS297	23KS298	23KS299	23KS301	23KS313
Sample Type				liquid	liquid	liquid	liquid	liquid
Sampling Time / Date				n/a	n/a	n/a	n/a	n/a
Sample Description				IGET Goat - Cherry Ice - 5000 puffs	Gunnpod Meta - Grape Ice - 4500 puffs	Gunnpod Wave - Summer Breeze - 3500 puffs	IGET Mega - Strawberry Banana Ice - 3000 puffs	Waka Smash - Apple surge - 6000 puffs
Method	Analysis for drugs by GCMS	Units	Reporting Limit	23KS875	23KS876	23KS877	23KS878	23KS879
12792	Butyraldehyde	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	2,4-Butadione	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	2,3-Pentadione	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Acetoin	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Benzaldehyde	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Tolualdehyde	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Cinnamaldehyde	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
15506*	**Vitamin E acetate**	mg/kg	50	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Ethylene glycol	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Diethylene glycol	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR

* Analysed by QIS 15506 - Qualitative and/or Quantitative Analysis using Liquid Chromatography Separation with Mass Spectrometer Detection (LC-Orbitrap)

Table 4: General Organic Screen by LC-Orbitrap (Pesticides/Herbicides/Fungicides) for SSP83249

Lab No.	Sample Reference	Sample Description	Compounds detected
23KS870	22KS5561	HQD Cuvie Plus - Strawberry Watermelon	Nicotine
23KS871	22KS5570	HQD Cuvie Plus - Passionfruit	Nicotine
23KS872	22KS6288	IGET Bar - Peach Ice - 3500 puffs	Nicotine
23KS873	22KS6292	IGET Bar - Blackberry Ice - 3500 puffs	Nicotine
23KS874	22KS6328	IGET XXL - Lush Ice - 1800 puffs	Nil
23KS875	23KS297	IGET Goat - Cherry Ice - 5000 puffs	Nicotine
23KS876	23KS298	Gunnpod Meta - Grape Ice - 4500 puffs	Nicotine
23KS877	23KS299	Gunnpod Wave - Summer Breeze - 3500 puffs	Nicotine
23KS878	23KS301	IGET Mega - Strawberry Banana Ice - 3000 puffs	Nicotine
23KS879	23KS313	Waka Smash - Apple surge - 6000 puffs	Nicotine

Table 5: General Organic Screen by GCMS (Volatile Organic Compounds) for SSP83249

Lab No.	Sample Reference	Sample Description	Compounds detected
23KS870	22KS5561	HQD Cuvie Plus - Strawberry Watermelon	Propylene glycol, Glycerin, Nicotine, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, 3-Hexene-1-ol, Ethyl Maltol, Methyl Cinnamate, Gamma-decanolactone, Hedione
23KS871	22KS5570	HQD Cuvie Plus - Passionfruit	Propylene glycol, Glycerin, Nicotine, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, 3-Hexene-1-ol, Gamma-decanolactone
23KS872	22KS6288	IGET Bar - Peach Ice - 3500 puffs	Propylene glycol, Glycerin, Nicotine, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, Neomenthol, Gamma-decanolactone, Gamma-heptylbutyrolactone
23KS873	22KS6292	IGET Bar - Blackberry Ice - 3500 puffs	Propylene glycol, Glycerin, Nicotine, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, 3-Hexene-1-ol, 1,2-Propanediol-1-acetate, Neomenthol, Hydrocinnamic acid, Gamma-heptylbutyrolactone
23KS874	22KS6328	IGET XXL - Lush Ice - 1800 puffs	Propylene glycol, Glycerin, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, 3-Hexene-1-ol, Vanillin, Gamma-decanolactone, Hedione
23KS875	23KS297	IGET Goat - Cherry Ice - 5000 puffs	Propylene glycol, Glycerin, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, 3-Hexene-1-ol, Benzaldehyde, Neomenthol, Benzaldehyde propylene glycol acetal, 4-Acetylanisole,
23KS876	23KS298	Gunnpod Meta - Grape Ice - 4500 puffs	Propylene glycol, Glycerin, Nicotine, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, Ethyl butyrate, 3-Hexene-1-ol, Menthol, Ethyl Maltol, Methyl Anthranilate, Methyl Methanthranilate, Gamma-decanolactone, N-ethyl Dodecanamide
23KS877	23KS299	Gunnpod Wave - Summer Breeze - 3500 puffs	Propylene glycol, Glycerin, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, 3-Hexene-1-ol, Methylbutyric acid, Butoxyethanol, Ethyl Maltol, Gamma-decanolactone
23KS878	23KS301	IGET Mega - Strawberry Banana Ice - 3000 puffs	Propylene glycol, Glycerin, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, 3-Hexene-1-ol, Banana oil, Neomenthol, Ethyl Maltol, Gamma-decanolactone
23KS879	23KS313	Waka Smash - Apple surge - 6000 puffs	Propylene glycol, Glycerin, Nicotine, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, Ethyl butyrate, 3-Hexene-1-ol, Banana oil, Hexyl alcohol, Hexyl caproate, Isoamyl butanoate, Ethyl succinate, Benzyl acetate, Methyl cinnamate, Vanillin, Isopropyl cinnamate, Ethyl vanillin, Gamma-heptylbutyrolactone

CERTIFICATE OF ANALYSIS

Laboratory Reference: SSP83249

Laboratory Number: 23KS870-879

Table 6: Results for Heavy Metal analysis#

Client Reference				22KS5561	22KS5570	22KS6288	22KS6292	22KS6328
Sample Type				**liquid**	**liquid**	**liquid**	**liquid**	**liquid**
Sampling Time / Date				n/a	n/a	n/a	n/a	n/a
Sample Description				HQD Cuvie Plus - Strawberry Watermelon	HQD Cuvie Plus - Passionfruit	IGET Bar - Peach Ice - 3500 puffs	IGET Bar - Blackberry Ice - 3500 puffs	IGET XXL - Lush Ice - 1800 puffs
Method	**Vegetation ICP-MS analysis**	**Units**	**Reporting Limit**	**23KS870**	**23KS871**	**23KS872**	**23KS873**	**23KS874**
12659	Aluminium	mg/kg	0.1	**0.29**	**0.24**	**0.57**	**0.13**	**0.8**
12659	Vanadium	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Chromium	mg/kg	0.01	**0.059**	**0.079**	**0.079**	**0.083**	**0.12**
12659	Manganese	mg/kg	0.01	**0.047**	**0.04**	**0.037**	**0.02**	**0.015**
12659	Iron	mg/kg	0.1	**0.33**	**0.36**	**0.8**	**0.34**	**0.52**
12659	Cobalt	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Nickel	mg/kg	0.01	**0.049**	**0.061**	**0.038**	**0.017**	**0.09**
12659	Copper	mg/kg	0.05	< LOR	**0.05**	**0.21**	**0.13**	**0.62**
12659	Zinc	mg/kg	0.05	**1.4**	**1.1**	**1.4**	**1.2**	**1.2**
12659	Arsenic	mg/kg	0.005	**0.025**	**0.049**	**0.052**	**0.053**	**0.049**
12659	Selenium	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Strontium	mg/kg	0.01	**0.03**	**0.02**	**0.03**	**0.01**	**0.01**
12659	Molybdenum	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Silver	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Cadmium	mg/kg	0.005	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Tin	mg/kg	0.05	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Antimony	mg/kg	0.01	**0.49**	**0.53**	**0.55**	**0.82**	**0.67**
12659	Barium	mg/kg	0.01	**0.022**	**0.013**	**0.031**	**0.011**	**0.015**
12659	Mercury	mg/kg	0.005	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Lead	mg/kg	0.005	< LOR	**0.012**	**0.005**	**0.009**	< LOR

CERTIFICATE OF ANALYSIS

Laboratory Reference: SSP83249

Laboratory Number: 23KS870-879

Table 6: Results for Heavy Metal analysis (con't)[#]

Client Reference				23KS297	23KS298	23KS299	23KS301	23KS313
Sample Type				liquid	liquid	liquid	liquid	liquid
Sampling Time / Date				n/a	n/a	n/a	n/a	n/a
Sample Description				IGET Goat - Cherry Ice - 5000 puffs	Gunnpod Meta - Grape Ice - 4500 puffs	Gunnpod Wave - Summer Breeze - 3500 puffs	IGET Mega - Strawberry Banana Ice - 3000 puffs	Waka Smash - Apple surge - 6000 puffs
Method	Vegetation ICP-MS analysis	Units	Reporting Limit	23KS875	23KS876	23KS877	23KS878	23KS879
12659	Aluminium	mg/kg	0.1	< LOR	0.11	< LOR	3.1	< LOR
12659	Vanadium	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Chromium	mg/kg	0.01	0.064	0.089	0.077	0.082	0.083
12659	Manganese	mg/kg	0.01	0.023	0.027	0.13	0.028	0.026
12659	Iron	mg/kg	0.1	0.19	0.59	0.47	2	0.57
12659	Cobalt	mg/kg	0.01	< LOR	0.027	< LOR	< LOR	< LOR
12659	Nickel	mg/kg	0.01	0.015	0.41	0.47	1.2	0.037
12659	Copper	mg/kg	0.05	< LOR	28	0.85	71	< LOR
12659	Zinc	mg/kg	0.05	3.6	22	3.2	63	1.6
12659	Arsenic	mg/kg	0.005	0.052	0.046	0.062	0.06	0.081
12659	Selenium	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Strontium	mg/kg	0.01	< LOR	< LOR	0.02	0.02	0.03
12659	Molybdenum	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Silver	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Cadmium	mg/kg	0.005	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Tin	mg/kg	0.05	< LOR	0.29	< LOR	1.2	< LOR
12659	Antimony	mg/kg	0.01	0.04	0.89	0.64	0.92	0.05
12659	Barium	mg/kg	0.01	0.01	0.016	0.061	0.023	0.022
12659	Mercury	mg/kg	0.005	< LOR	< LOR	< LOR	0.013	< LOR
12659	Lead	mg/kg	0.005	< LOR	2.4	< LOR	8.8	< LOR

[#] Tobacco samples were prepared for analysis by microwave digestion in nitric acid according to method QIS12659v8 "Determination of Trace Elements in Foods by ICP-MS after Microwave Digestion". This method is applicable to the determination of trace elements (Al, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Sr, Mo, Ag, Cd, Sn, Sb, Ba, Hg, Pb) in a wide variety of food samples, including plants.
The resultant digest solution was then analysed by Triple Quadrupole Inductively Coupled - Mass Spectrometer (QQQ ICP-MS) for the aforementioned list of metals using instrument method QIS27441v5 "Determination of Trace Elements in Aqueous Solutions by ICP-MS".
The Inorganic Chemistry laboratory is accredited by NATA as compliant with ISO/IEC17025 (2017) for methods QIS12659v8 and QIS12659v5. Tobacco is dried plant material and therefore aligns to herbs, vegetables and vegetable products which are included in the current scope of accreditation for the Inorganic Chemistry laboratory. Tobacco is therefore covered under the scope of accreditation.

SSP83249

Queensland Government

Forensic and Scientific Services

AMENDED CERTIFICATE OF ANALYSIS

CLIENT: QP Health & Environment Committee
Queensland Parliament
Alice St
BRISBANE QLD 4000

ATTN: Aaron Harper MP

CC: Louise [redacted]

Laboratory Reference	: SSP83440
Client Order Number	: n/a
Quote Number	: n/a
Client Project	: n/a
Client Batch Reference	: n/a
Date Received	: 28-Apr-2023
Date Commenced	: 1-May-2023
Laboratory Number/s	: 23KS935-941

Submitting Authority : Queensland Parliament Health & Environment Committee

Number of Samples : Seven (7) e-cigarette devices

Reason for Analysis : Quantitation of nicotine
Quantitation of compounds outlined in Subsection 7(3) Schedule 1 of the TGA document TGO 110
Quantitation of carbonyl compounds
Pesticide/Herbicide Screens
Heavy metals screen

Method/s of Analysis : QIS34310 – Nicotine Analysis

QIS15506 - Qualitative and/or Quantitative Analysis using Liquid Chromatography Separation with Mass Spectrometer Detection

QIS12659 - Determination of Trace Elements in Foods by ICP-MS after Microwave Digestion

QIS12792 – Analysis of drugs by classical (Pharmacopeia), GC, GCMS, HPLC, UV/VIS HPLC/MS methods

Remarks : Sample details and results are summarised in Tables 1 - 6

s.73 - Irrelevant information

David P[redacted]
Senior Chemist, Organics Laboratory
17th May 2023

Enquiries David P[redacted]
Phone s.73 - Irrelevant information
Email s.73 - Irrelevant information @health.qld.gov.au

39 Kessels Road
Coopers Plains QLD 4108
AUSTRALIA

PO Box 594
Archerfield QLD 4108
AUSTRALIA

Phone (+61 7) s.73 - Irrelevant in
Fax (+61 7) [redacted]
Email s.73 - Irre @health.qld.gov.au

CERTIFICATE OF ANALYSIS

Laboratory Reference: SSP83440
Laboratory Number: 23KS935-941

Table 1: Nicotine Results for SSP83440

Lab No.	Sample Reference	Sample Description	Results (mg/kg)
23KS935	1 KIRWIN	IGET Bar Strawberry Watermelon Ice	43000
23KS936	2 KIRWIN	Vorteke Melon	< LOR
23KS937	3 WYNNUM	IGET Bar Strawberry Lemon Ice	45000
23KS938	4 WYNNUM	IGET Legend Passionfruit Watermelon Ice	47000
23KS939	5 BELLARA	IGET Bar Grape Ice	47000
23KS940	6 BELLARA	IGET Bar Kiwi Pineapple Ice	45000
23KS941	7 BELLARA	IGET Legend Blueberry Blackberry Ice	44000

Limit of Reporting (< LOR) – 200 mg/kg

CERTIFICATE OF ANALYSIS

Laboratory Reference: SSP83440
Laboratory Number: 23KS935-941

Table 2: Carbonyl results for SSP83440

Client Reference				1 KIRWAN	2 KIRWAN	3 WYNNUM	4 WYNNUM	5 BELLARA	6 BELLARA	7 BELLARA
Sample Type				liquid	liquid	liquid	liquid	liquid	liquid	liquid
Sampling Time / Date				1707 04/04/2023	1712 04/04/2023	04/2023	04/2023	06/04/2023	06/04/2023	06/04/2023
Sample Description				IGET Bar Strawberry Watermelon Ice	Vorteke Melon	IGET Bar Strawberry Lemon Ice	IGET Legend Passionfruit Watermelon Ice	IGET Bar Grape Ice	IGET Bar Kiwi Pineapple Ice	IGET Legend Blueberry Blackberry Ice
Method	Analysis for drugs by GCMS	Units	Reporting Limit	23KS935	23KS936	23KS937	23KS938	23KS939	23KS940	23KS941
12792	Formaldehyde	mg/kg	20	37	30	54	28	47	40	23
12792	Acetaldehyde	mg/kg	20	46	79	48	100	50	460*	71
12792	Acetone	mg/kg	20	130	41	88	150	220*	300*	220*
12792	Acrolein	mg/kg	20	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Propionaldehyde	mg/kg	20	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Hexaldehyde	mg/kg	20	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Benzaldehyde	mg/kg	20	120	< LOR	140	< LOR	< LOR	< LOR	< LOR
12792	p-Tolualdehyde	mg/kg	20	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR

* Above top calibration standard – estimate only

CERTIFICATE OF ANALYSIS

Laboratory Reference: SSP83440
Laboratory Number: 23KS935-941

Table 3: Results for TGO 110 compounds

Client Reference				1 KIRWAN	2 KIRWAN	3 WYNNUM	4 WYNNUM	5 BELLARA	6 BELLARA	7 BELLARA
Sample Type				**liquid**	**liquid**	**liquid**	**liquid**	**liquid**	**liquid**	**liquid**
Sampling Time / Date				1707 04/04/2023	1712 04/04/2023	04/2023	04/2023	06/04/2023	06/04/2023	06/04/2023
Sample Description				IGET Bar Strawberry Watermelon Ice	Vorteke Melon	IGET Bar Strawberry Lemon Ice	IGET Legend Passionfruit Watermelon Ice	IGET Bar Grape Ice	IGET Bar Kiwi Pineapple Ice	IGET Legend Blueberry Blackberry Ice
Method	**Analysis for drugs by GCMS**	**Units**	**Reporting Limit**	**23KS935**	**23KS936**	**23KS937**	**23KS938**	**23KS939**	**23KS940**	**23KS941**
12792	Butyraldehyde	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12792	2,4-Butadione	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12792	2,3-Pentadione	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Acetoin	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Benzaldehyde	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Tolualdehyde	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Cinnamaldehyde	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
15506*	**Vitamin E acetate**	mg/kg	**50**	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Ethylene glycol	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12792	Diethylene glycol	mg/kg	2000	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR

* Analysed by QIS 15506 - Qualitative and/or Quantitative Analysis using Liquid Chromatography Separation with Mass Spectrometer Detection (LC-Orbitrap)

Table 4: General Organic Screen by LC-Orbitrap (Pesticides/Herbicides/Fungicides) for SSP83440

Lab No.	Sample Reference	Sample Description	Compounds detected
23KS935	1 KIRWIN	IGET Bar Strawberry Watermelon Ice	Nicotine, Vanillin
23KS936	2 KIRWIN	Vorteke Melon	Nicotine (trace), Vanillin
23KS937	3 WYNNUM	IGET Bar Strawberry Lemon Ice	Nicotine, Vanillin
23KS938	4 WYNNUM	IGET Legend Passionfruit Watermelon Ice	Nicotine, Vanillin
23KS939	5 BELLARA	IGET Bar Grape Ice	Nicotine, Vanillin
23KS940	6 BELLARA	IGET Bar Kiwi Pineapple Ice	Nicotine, Vanillin
23KS941	7 BELLARA	IGET Legen Blueberry Blackberry Ice	Nicotine, Vanillin

Table 5: General Organic Screen by GCMS (Volatile Organic Compounds) for SSP83440

Lab No.	Sample Reference	Sample Description	Compounds detected
23KS935	1 KIRWIN	IGET Bar Strawberry Watermelon Ice	Propylene glycol, Glycerin, Nicotine, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, 3-Hexene-1-ol, Neomenthol, gamma-Decanolactone, Methyl-cinnamate, Methyl-dihydrojasmonate
23KS936	2 KIRWIN	Vorteke Melon	Propylene glycol, Glycerin, Nicotine (trace), 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, Isobutyl acetate, Ethyl lactate, 3-Hexene-1-ol, gamma-Decanolactone,
23KS937	3 WYNNUM	IGET Bar Strawberry Lemon Ice	Propylene glycol, Glycerin, Nicotine, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, 3-Hexene-1-ol, 2-Methyl butyric acid, Dihydro-Terpineol, Alpha-Terpineol, gamma-Decanolactone, N-ethyl-Dodecamide
23KS938	4 WYNNUM	IGET Legend Passionfruit Watermelon Ice	Propylene glycol, Glycerin, Nicotine, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, 3-Hexene-1-ol, Neomenthol, gamma-Decanolactone,
23KS939	5 BELLARA	IGET Bar Grape Ice	Propylene glycol, Glycerin, Nicotine, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, Methyl anthranilate, Ethyl propanoate, Ethyl butanoate, 3-Hexene-1-ol, Phenethyl alcohol, Neomenthol, gamma-Decanolactone,

CERTIFICATE OF ANALYSIS

Laboratory Reference: SSP83440
Laboratory Number: 23KS935-941

Table 5: General Organic Screen by GCMS (Volatile Organic Compounds) for SSP83440

Lab No.	Sample Reference	Sample Description	Compounds detected
23KS940	6 BELLARA	IGET Bar Kiwi Pineapple Ice	Propylene glycol, Glycerin, Nicotine, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, Methyl anthranilate, Ethyl butanoate, 3-Hexene-1-ol, 3-Hexenol acetate, Allyl caproate, N-Ethyl dodecamide
23KS941	7 BELLARA	IGET Legend Blueberry Blackberry Ice	Propylene glycol, Glycerin, Nicotine, 2-Isopropyl-N,2,3-trimethylbutanamide (WS-23), Benzoic acid, Isoamyl acetate, 3-Hexene-1-ol

CERTIFICATE OF ANALYSIS

Laboratory Reference: SSP83440
Laboratory Number: 23KS935-941

Table 6: Results for Heavy Metal analysis#

Client Reference				1 KIRWAN	2 KIRWAN	3 WYNNUM	4 WYNNUM	5 BELLARA	6 BELLARA	7 BELLARA
Sample Type				liquid	liquid	liquid	liquid	liquid	liquid	liquid
Sampling Time / Date				1707 04/04/2023	1712 04/04/2023	04/2023	04/2023	06/04/2023	06/04/2023	06/04/2023
Sample Description				IGET Bar Strawberry Watermelon Ice	Vorteke Melon	IGET Bar Strawberry Lemon Ice	IGET Legend Passionfruit Watermelon Ice	IGET Bar Grape Ice	IGET Bar Kiwi Pineapple Ice	IGET Legend Blueberry Blackberry Ice
Method	Vegetation ICP-MS analysis	Units	Reporting Limit	23KS935	23KS936	23KS937	23KS938	23KS939	23KS940	23KS941
12659	Aluminium	mg/kg	0.1	0.18	0.47	0.27	0.68	0.46	0.43	0.17
12659	Vanadium	mg/kg	0.01	0.032	0.039	0.1	0.11	0.1	0.09	0.12
12659	Chromium	mg/kg	0.01	0.021	0.1	0.011	0.019	0.024	0.031	< LOR
12659	Manganese	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Iron	mg/kg	0.1	< LOR	2.3	< LOR	< LOR	0.2	0.2	< LOR
12659	Cobalt	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Nickel	mg/kg	0.01	< LOR	0.1	< LOR	0.02	< LOR	< LOR	< LOR
12659	Copper	mg/kg	0.05	0.073	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Zinc	mg/kg	0.05	0.9	14	0.35	1.3	4.5	4.2	0.9
12659	Arsenic	mg/kg	0.005	0.011	0.018	0.013	0.019	0.016	0.012	0.02
12659	Selenium	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Strontium	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Molybdenum	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Silver	mg/kg	0.01	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Cadmium	mg/kg	0.005	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Tin	mg/kg	0.05	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Antimony	mg/kg	0.01	0.47	< LOR	< LOR	0.45	0.68	0.02	0.59
12659	Barium	mg/kg	0.01	< LOR	< LOR	< LOR	0.019	0.015	0.011	0.025
12659	Mercury	mg/kg	0.005	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
12659	Lead	mg/kg	0.005	< LOR	0.06	< LOR	< LOR	< LOR	< LOR	< LOR

Tobacco samples were prepared for analysis by microwave digestion in nitric acid according to method QIS12659v8 "Determination of Trace Elements in Foods by ICP-MS after Microwave Digestion". This method is applicable to the determination of trace elements (Al, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Sr, Mo, Ag, Cd, Sn, Sb, Ba, Hg, Pb) in a wide variety of food samples, including plants.
The resultant digest solution was then analysed by Triple Quadrupole Inductively Coupled - Mass Spectrometer (QQQ ICP-MS) for the aforementioned list of metals using instrument method QIS27441v5 "Determination of Trace Elements in Aqueous Solutions by ICP-MS".
The Inorganic Chemistry laboratory is accredited by NATA as compliant with ISO/IEC17025 (2017) for methods QIS12659v8 and QIS12659v5. Tobacco is dried plant material and therefore aligns to herbs, vegetables and vegetable products which are included in the current scope of accreditation for the Inorganic Chemistry laboratory. Tobacco is therefore covered under the scope of accreditation.

David W

From: Rebecca s.73 - Irrelevant information
Sent: Thursday, 18 May 2023 10:00 AM
To: David W Suzanne s.73 - Irrelevant information; U s.73 - Irrelev s.73 - Irrelevant nformation Colleen s.73 - Irrelevant information Mark s.73 - Irrelevant information
Subject: RE: URGENT: Health and Environment Committee - testing of smoking products
Attachments: DG Brief HEC request e-cigarette analysis.docx; Attachment 1 Letter HEC e-cigarette analysis.docx; Attachment 2 - Assessment of e-liquid composition.docx

Hello All,

Please find a revised package with feedback received so far.

David I am sorry I missed you when I tried to call I guess we are playing phone tag.

I am going into training now until 1pm, if final feedback can be provided by then that would be fantastic.

Best Regards
Rebecca

Queensland Government

Rebecca s.73 - Irrelevant information
Advanced Health Promotion Officer
Prevention Strategy Branch | Queensland Health
Working hours Monday to Friday

P s.73 - Irrelevant information
E s.73 - Irrelevant information health.qld.gov.au
W health.qld.gov.au
A 15 Butterfield Street, Herston

From: David W < s.73 - Irrelevant information health.qld.gov.au>
Sent: Thursday, 18 May 2023 8:12 AM
To: Rebecca s.73 - Irrelevant information s.73 - Irrelevant information elevant information @health.qld.gov.au>
Cc: Suzanne s.73 - Irrelevant information @health.qld.gov.au>; U s.73 - Irrelev s.73 - Irrelevant information s.73 - Irrelevant information @health.qld.gov.au>
Subject: URGENT: Health and Environment Committee - testing o ng products

Hi Rebecca,

Been trying to call you but no luck.

I have attached an updated Attachment 2 – with comments and a couple of agreed changes (still in tracked changes). Suzanne is happy with this version – she also made a couple of minor amendments this morning.

I would have liked to talk to you about these – can you let me know when you're available?

I haven't yet reviewed the brief.

Kind Regards

Queensland Government

David W

Advanced Environmental Health Scientist
Environmental Hazards Unit
Health Protection Branch, Queensland Public Health and Scientific Services | Queensland Health

E s.73 - Irrelevant information health.qld.gov.au
W health.qld.gov.au

Queensland Health acknowledges the Traditional Custodians of the land across Queensland, and pays respect to First Nations Elders past, present and future.

SUBJECT: The Chair of the Health and Environment Committee requested analysis of e-cigarettes to inform current inquiry into reducing e-cigarette use in Queensland.

☐ Approved ☐ Not approved ☐ Noted ☐ Further information required (see comments)	Signed…… Date……../……../…….. Shaun Drummond, Director-General, Queensland Health Comments:

ACTION REQUIRED BY
The analysis of vapes must be provided to the Health and Environment Committee by 23 May 2023 (the Committee).

RECOMMENDATION
It is recommended the Director-General:

- **Sign** the attached letter to Mr Aaron Harper MP, Chair of the Committee, regarding the requested analysis of e-cigarettes (Attachment 1); and
- **Approve** the report of e-cigarettes analysis (Attachment 2)

ISSUES

1. The Committee requested assistance with the analysis of e-cigarettes and s.73 - Irrelevant information
   1.1. On 4 April 2023, the Chair of the Committee wrote to the Director-General seeking advice on whether the Department's Forensic and Scientific Services (FSS) can assist with analysis of disposable e-cigarettes and s.73 - Irrelevant information
   1.2. s.73 - Irrelevant information .
   1.3. The e-cigarette report must be provided to the Committee by 23 May 2023.
   1.4. The Committee provided seven e-cigarette samples for analysis. Another 10 came from goods seized in state-wide compliance activities (Queensland Health and Queensland Police Service).
2. The e-cigarette samples contain nicotine, other prohibited and dangerous substances
   2.1. The samples were analysed by FFS and a brief report of the results is provided (Attachment 2).
   2.2. All 17 samples of e-liquid products analysed contained nicotine.
   2.3. All 17 samples contained various volatile organic compounds, typically used and produced in the manufacture of paints, pharmaceuticals, and refrigerants.
   2.4. All samples contained between five to 15 heavy metals. A number of these heavy metals are considered toxic when inhaled including arsenic and zinc, these were detected in all samples.
   2.5. Initially, standard testing did not detect ingredients prohibited by the Therapeutic Goods Administration under their Standard for Nicotine Vaping Products TGO 110.
   2.6. Testing with a different analysis method found benzaldehyde, which is a prohibited under TGO 110.
   2.7. Further testing would be required to ascertain if samples contain prohibited ingredients above the detection limit set under TGO 110. This was not viable in the timeframe.
3. A covering letter has been prepared from the Director-General to the Committee Chair (Attachment 1).

BACKGROUND

4. On 14 March 2023 the Legislative Assembly agreed to a motion to inquire into: s.73 - Irrelevant information and 2) reducing rates of e-cigarette use in Queensland. The Committee is due to table a report on reducing e-cigarette use by 31 August 2023.
5. Public hearings on the Bill were conducted on 12 April 2023 in Townsville and 14 April 2023 in Brisbane.
6. At these public hearings the Committee heard evidence and views from stakeholders on reducing e-cigarette use in Queensland.
7. On 3 May 2023 the Departmental representatives appeared with the Chief Health Officer at a public briefing at the request of the Committee to provide evidence on health impacts of e-cigarette use and information on current measures to monitor and reduce use.

RESULTS OF CONSULTATION

8. Hospital and Health Services provided samples of e-cigarettes that had been seized by Public Health Units.

RESOURCE/FINANCIAL IMPLICATIONS

9. There are no resource or financial implications associated with this brief.

HUMAN RIGHTS

10. Human rights are not engaged in providing analysis of the e-cigarette samples.

SENSITIVITIES/RISKS

11. There are no sensitivities or risks associated with this brief.

ATTACHMENTS

12. Attachment 1 - Letter from the Director-General to the Chair of the Committee
    Attachment 2 – Assessment of e-liquid composition

Author	**Cleared by (Dir/Snr Dir)**	**Content verified by (DDG/CE)**
Name: Rebecca Position: Advanced Health Promotion Officer Unit: Prevention Strategy Tel No s.73 - Irrelevant information Date Drafted: 18 May 2023	Name: Mark t Position: Executive Director Branch: Prevention Strategy Branch Tel No: s.73 - Irrelevant information Date Cl 2023 **Note clearance contact is also key contact for brief queries**	Name: Jasmina Joldić Position: Associate Director-General Division: Strategy, Policy and Reform Tel No: s.73 - Irrelevant information Date Verified: XX May 2023

Queensland Government

Queensland Health

Enquiries to: Mark
Executive Director
Prevention Strategy Branch
Telephone: s.73 - Irrelevant information
Our ref: C-ECTF-Number
Your ref:

Mr Aaron Harper
Chair
Health and Environment Committee
Parliament House
George Street
BRISBANE QLD 4000

Email: s.73 - Irrelev@parliament.qld.gov.au

Dear Mr Harper

Thank you for your letter dated 4 April 2023 seeking advice on whether the Department's Forensic and Scientific Services (FSS) can assist with analysis of electronic cigarettes. tobacco (chop-chop). We previously provided a report on the analysis of illegal tobacco, thank you for the acknowledgement of this report.

We received the seven e-cigarette samples sourced by the Committee, thank you. These samples have been analysed along with ten further samples sourced from state-wide compliance activities from government departments (Queensland Health and Queensland Police Service).

The samples have been analysed using qualitative or quantitative analyses to test for nicotine and prohibited substances under the Therapeutic Goods Administration's Standard for Nicotine Vaping Products TGO 110. Tests were also included for other substances of concern such as carbonyl compounds, volatile organic compounds, and heavy metals.

This analysis is provided in the report at Attachment 1.

Thank you again for the opportunity to assist the Committee with its inquiry. I look forward to the Committee's report and recommendations on reducing rates of e-cigarette use in Queensland.

Yours sincerely

Shaun Drummond
Director-General

Level 37
1 William St Brisbane
GPO Box 48 Brisbane
Queensland 4000 Australia

Website health.qld.gov.au
Email s.73 - Irrelevant information@health.qld.gov.au
ABN 66 329 169 412

Prepared by: Rebecca [redacted]
Advanced Health Promotion Officer
Prevention Strategy Branch
s.73 - Irrelevant information [redacted]
18 May 2023

Submitted through: Mark [redacted]
Executive Director
Prevention Strategy Branch
s.73 - Irrelevant information [redacted]
XX May 2023

Cleared by: Jasmina Joldić PSM
Associate Director-General
Strategy, Policy and Reform
s.73 - Irrelevant information [redacted]
XX May 2023

Document Name: C-ECTF-XXXXX

Assessment of e-liquid composition

For the Queensland Parliament - Health & Environment Committee

1. Purpose

To assess the chemical composition of e-liquids that are currently in vaping products available in Queensland.

2. Scope

To analyse the chemical composition of seventeen (17) e-liquid samples currently available in the Queensland vape market.

Seven (7) e-liquid samples were sourced from Health & Environment Committee (the Committee) and ten (10) samples were sourced from state-wide compliance activities from government departments (Queensland Health and Queensland Police Service).

3. Background

E-cigarette products marketed and sold in Queensland are not assessed in relation to their quality or safety.

Public health concerns have been raised by the community and by health practitioners regarding the risks of vaping products and their aerosols. In addition to nicotine, liquids used in electronic cigarettes also contain other chemical additives which have the potential to pose serious health risks to users. E-liquids are reported to contain other chemical additives such as flavours, solvents, preservatives, and contaminants that may be harmful to health when inhaled as part of vaping.

4. Laboratory Analysis

The 17 e-liquid samples were analysed by Queensland Health Forensic and Scientific Services (QH FSS) using the available laboratory methods. Qualitative or quantitative analyses were undertaken for nicotine, prohibited substances under the Therapeutic Goods Administration's - Therapeutic Goods (Standard for Nicotine Vaping Products) (TGO 110) Order 2021 (TGO 110), and other substances of concern such as carbonyl compounds, volatile organic compounds (VOCs), pesticides/fungicides/herbicides, and heavy metals.

The detection limit for the analytes was determined by QHFSS based on its current analytical capability. This may vary from the compliance limits established for the substances.

5. Results and Discussion

The 17 samples were analyzed for nicotine and other substances of concern such as carbonyl compounds, VOCs, pesticides, and heavy metals, and eight substances that are prohibited ingredients in vapes under the TGO 110.

E-liquids are also known to contain other chemical additives (flavourings and preservatives) and contaminants that have the potential to pose a serious health risk to vape users. These chemical additives and contaminants typically include various carbonyl compounds, VOCs, and heavy metals.

The results of the 17 samples are discussed below.

5.1 Nicotine

Nicotine was found in all e-liquid samples, as shown in Table 1. The nicotine content ranged from trace levels (<200 mg/kg) to 47,000 mg/kg.

Under Queensland's *Medicines and Poisons Act 2019*, vaping devices containing nicotine may only be obtained at a pharmacy under the prescription of a medical practitioner. Such devices may contain up to 100 mg/ml (100,000 mg/kg) of nicotine. Vaping products which contain nicotine and are sourced from other retailers are illegal under the *Medicines and Poisons Act 2019*. As these samples were NOT obtained through a pharmacy via a prescription, **nicotine should not have been present in any samples.**

The capacity of e-cigarettes to deliver nicotine and other harmful chemicals into the body varies widely, ranging from very low to levels like that of cigarettes, depending on product characteristics, user inhalation behaviour, and nicotine solution concentration.

The health risks of nicotine include neurological, cardiovascular, respiratory (impaired lung function), renal, and reproductive health effects. In some cases, high levels of exposure can lead to death. Young children, adolescents, pregnant and breastfeeding mothers, and the elderly are considered the most vulnerable to nicotine exposure. According to the World Health Organisation, nicotine itself is not a carcinogen, however, it may function as a "tumor promoter". Nicotine seems involved in fundamental aspects of the biology of malignant diseases, and neurodegeneration.

4.2 Prohibited ingredients

There are eight chemical compounds listed as prohibited ingredients under the TGO 110. These include 2,3-pentanedione, acetoin, benzaldehyde, cinnamaldehyde, diacetyl, diethylene glycol, dl-alpha-tocopheryl acetate (Vit E), and ethylene glycol. The compliance limit set under the TGO 110 is less than 10 parts per million (ppm).

The laboratory analysis in **Table 2** revealed that none of the seventeen (17) samples contained prohibited ingredients above the laboratory limit of reporting (LoR) or limit of detection of 2000ppm. This limit is significantly higher (x200) than the compliance limit set under the TGO 110.

Further analysis would need to be undertaken to ascertain that the samples do not contain prohibited ingredients above the detection limit set under TGO 110.

It should be noted that using a different analytical method, which is used to assess carbonyls, benzaldehyde (carbonyl) was detected in two of the samples, at 28ppm and 66ppm (note 1 mg/kg = 1ppm). Benzaldehyde is a prohibited ingredient under TGO 110 with a compliance limit of <10 ppm, set by TGO 110.

There are known health risks associated with inhaling these prohibited ingredients identified in the TGO 110. These include irreversible lung damage; respiratory failure; toxicity of the brain, heart, and kidneys; and impairment of the immune cell function.

Table 1 - Nicotine

Lab Analysis (Limit of Reporting: 200 mg/kg)	IGET Bar Strawberry Watermelon Ice	Vorteke Melon	IGET Bar Strawberry Lemon Ice	IGET Legend Passionfruit Watermelon Ice	IGET Bar Grape Ice	IGET Bar Kiwi Pineapple Ice	IGET Legend Blueberry Blackberry Ice	HQD Cuvie Plus - Strawberry Watermelon	HQD Cuvie Plus – Passionfruit
Nicotine	Present	Present	Present	Present	Present	Present	Present	Present	Present
Concentration (mg/kg)	43,000	<200	45,000	47,000	47,000	45,000	44,000	38,000	44,000

Lab Analysis	IGET Bar - Peach Ice - 3500 puffs	IGET Bar - Blackberry Ice - 3500 puffs	IGET XXL - Lush Ice - 1800 puffs	IGET Goat - Cherry Ice - 5000 puffs	Gunnpod Meta - Gra Ice - 4500 puffs	Gunnpod Wave - Su Breeze - 3500 pu	IGET Mega - Strawberry Banana Ice - 3000 puffs	Waka Smash - Apple surge - 6000 puffs
Nicotine	Present	Present	Present	Present	Present	Present	Present	Present
Concentration (mg/kg)	37,000	33,000	<200	28,000	30,000	12,000	35,000	30,000

Table 2 – Prohibited substances under TGO 110

Vaping liquid Samples tested (Limit of Reporting 2000mg/kg except for Vitamin E acetate 50 mg/kg))	TGO110 - Prohibited Substances							
	2,4-Butadione	2,3-Pentadione	Acetoin	Benzaldehyde	Cinnamaldehyde	Vitamin E acetate	Ethylene glycol	Diethylene glycol
IGET Bar Strawberry Watermelon Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
Vorteke Melon	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar Strawberry Lemon Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Legend Passionfruit Watermelon Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar Grape Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar Kiwi Pineapple Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Legend Blueberry Blackberry Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
HQD Cuvie Plus - Strawberry Watermelon	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
HQD Cuvie Plus – Passionfruit	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar - Peach Ice - 3500 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar - Blackberry Ice - 3500 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET XXL - Lush Ice - 1800 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Goat - Cherry Ice - 5000 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
Gunnpod Meta - Grape Ice - 4500 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
Gunnpod Wave - Summer Breeze - 3500 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Mega - Strawberry Banana Ice - 3000 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
Waka Smash - Apple surge - 6000 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR

5.3 Other Chemicals of Concern

5.3.1 Carbonyl compounds

All 17 samples of e-liquids were found to contain carbonyl compounds. All samples contained at least two carbonyl compounds (formaldehyde and acetaldehyde) and 16 samples contained acrolein.

Carbonyl compounds are considered irritants of the mucosal tissue of the lungs. Some of these compounds are potentially harmful to health. For example, formaldehyde is classified as a Group 1 human carcinogen by the International Agency for Research on Cancer, and acetaldehyde is classified as possibly carcinogenic to humans (Group 2B); while acrolein causes irritation of the nasal cavity and damages the lining of the lungs.

5.3.2 Volatile Organic Compounds

VOCs are a class of organic compound chemicals (usually found in gaseous form) that are typically used and produced in the manufacture of paints, pharmaceuticals, and refrigerants.

All 17 samples contained various VOCs. Five VOCs are common to all 17 samples: propylene glycol, glycerin, 2-isopropyl-N,2,3-trimethylbutanamide, benzoic acid, and 3-hexene-1-ol.

Propylene glycol and glycerin are the main components of e-liquids. They are known to be hazardous when inhaled. Heating propylene glycol and glycerin in e-cigarettes produces lung disease hazards and inhaling these compounds makes the lungs vulnerable to infections. Breathing aerosolised propylene glycol can affect the risk of asthma development.

While some of the VOCs detected are not known to pose health risks, many of these have been flagged for critical health concerns. For example, methyl anthranilate (found in three products) and ethyl propanoate (found in one product) are suspected carcinogens and either a mutagen, skin sensitiser or toxic to reproduction. Further, neomenthol (found in 7 products) and ethyl lactate have also been suspected to be toxic to reproduction.

5.3.3 Heavy Metals

All samples contained between five to fifteen heavy metals. Arsenic and zinc were detected in all samples. Other toxic heavy metals identified include lead, mercury, nickel, chromium, antimony, aluminium, iron, nickel, barium, manganese, copper, strontium, and vanadium.

A number of these heavy metals are known to be carcinogenic, mutagenic, toxic to reproduction and development, and cause neurological anomalies. Arsenic and nickel are carcinogens, while chromium and nickel are linked to respiratory diseases. Manganese, lead, and mercury are known to cause neurological and developmental defects. Barium may cause kidney problems, while vanadium may be toxic to the respiratory system.

6. Summary of Results

Several chemical compounds detected in e-liquids tested as part of this analysis have been reported to pose serious health risks to vape users. The analysis identified that:

- All 17 samples of e-liquid products analysed contained nicotine. The nicotine content ranged from trace levels (<200 mg/kg) to 47,000 mg/kg.

- None of the 17 samples analysed recorded prohibited ingredients above the laboratory detection limit of 2000 ppm. The detection limit employed by QHFSS is significantly higher (x 200) than the compliance limit set under the TGO 110 which is less than 10 ppm.
- Using a different analysis method, benzaldehyde, which is a prohibited ingredient under TGO 110, was detected in two of the samples, at 28ppm and 66ppm which is above the limit set by TGO 110 (<10 ppm).
- All 17 samples contained various VOCs. Five (5) VOCs are common to all 17 samples.
- All samples contained between five 5 to 15 heavy metals. A number of these heavy metals are considered toxic when inhaled including arsenic and zinc, which were detected in all samples.

David W

From: David W
Sent: Thursday, 18 May 2023 10:43 AM
To: Rebecca s.73 - Irrelevant information
Cc: Suzanne s.73 - Irrelevant U s.73 - Irrelevant information
Subject: RE: URGENT: Health and Environment Committee - testing of smoking products
Attachments: DG Brief HEC request e-cigarettes v2.docx; Attachment 2 - Assessment of e-liquid composition Final.docx

Hi Rebecca,

I have attached the latest cleared Attachment 2 – Assessment of e-liquid composition and also I have made some very minor amendments in the Brief (which I have left in tracked changes) – which are all in relation to the e-liquid assessment.

Happy to chat if need be. 😊

Kind Regards

Queensland Government

David W
Advanced Environmental Health Scientist
Environmental Hazards Unit
Health Protection Branch, Queensland Public Health and Scientific Services | Queensland Health

E s.73 - Irrelevant information health.qld.gov.au
W health.qld.gov.au

Queensland Health acknowledges the Traditional Custodians of the land across Queensland, and pays respect to First Nations Elders past, present and future.

From: Rebecca s.73 - Irrelevant information s.73 - Irrelevant information health.qld.gov.au>
Sent: Thursday, 18 May 2023 10:00 AM
To: David W s.73 - Irrelevant information health.qld.gov.au>; Suzanne s.73 - Irrelevant information s.73 - Irrelevant information health.qld.gov.au>; U s.73 - Irrelevan s.73 - Irrelevant information 73 - Irrelevant information health.qld.gov.au>; Collee s.73 - Irrelevant information s.73 - Irrelevant information health.qld.gov.au>; Mark s.73 - Irrelevant information information @health.qld.gov.au>
URGENT: Health and Environment Committee - testing of smoking products

Hello All,

Please find a revised package with feedback received so far.

David I am sorry I missed you when I tried to call I guess we are playing phone tag.

I am going into training now until 1pm, if final feedback can be provided by then that would be fantastic.

Best Regards
Rebecca

Queensland Government

Rebecca s.73 - Irrelevant information
Advanced Health Promotion Officer
Prevention Strategy Branch | Queensland Health
Working hours Monday to Friday

P s.73 - Irrelevant information
E s.73 - Irrelevant information @health.qld.gov.au
W health.qld.gov.au
A 15 Butterfield Street, Herston

From: David W s.73 - Irrelevant information @health.qld.gov.au>
Sent: Thursday, 18 May 2023 8:12 AM
To: Rebecca s.73 - Irrelevant information s.73 - Irrelevant information @health.qld.gov.au>
Cc: Suzanne s.73 - Irrelevant information s.73 - Irrelevant information @health.qld.gov.au>; U s.73 - Irreleva s.73 - Irrelevant information s.73 - Irrelevant information @health.qld.gov.au>
Subject: URGENT: Health and Environment Committee - testing of smoking products

Hi Rebecca,

Been trying to call you but no luck.

I have attached an updated Attachment 2 – with comments and a couple of agreed changes (still in tracked changes). Suzanne is happy with this version – she also made a couple of minor amendments this morning.

I would have liked to talk to you about these – can you let me know when you're available?

I haven't yet reviewed the brief.

Kind Regards

Queensland Government

David W
Advanced Environmental Health Scientist
Environmental Hazards Unit
Health Protection Branch, Queensland Public Health and Scientific Services | Queensland Health

E s.73 - Irrelevant information health.qld.gov.au
W health.qld.gov.au

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Queensland Health
DIRECTOR-GENERAL BRIEFING NOTE

C-ECTF-23/3930
Strategy, Policy, and Reform

SUBJECT: The Chair of the Health and Environment Committee requested analysis of e-cigarettes obtained in Queensland to inform current inquiry into reducing e-cigarette use in Queensland.

☐ Approved ☐ Not approved ☐ Noted ☐ Further information required (see comments)	Signed…… Date……../……../…….. Shaun Drummond, Director-General, Queensland Health Comments:

ACTION REQUIRED BY
The requested analysis of vapes must be provided by 23 May 2023, to the Health and Environment Committee (the Committee).

RECOMMENDATION
It is recommended the Director-General:

- **Sign** the attached letter to Mr Aaron Harper MP, Chair of the Committee, regarding the requested analysis of e-cigarettes (Attachment 1); and
- **Approve** the requested report of e-cigarettes analysis (Attachment 2)

ISSUES
Committee request

1. On 4 April 2023, the Chair of the Committee wrote to the Director-General seeking advice on whether the Department's Forensic and Scientific Services (FSS) can assist with analysis of disposable e-cigarettes anc s.73 - Irrelevant information
2. The Committee secretary agreed to separate reports on analysis of s.73 - Irrelevant information and e-cigarettes:
   2.1. s.73 - Irrelevant information .
   2.2. E-cigarette report to be provided to the Committee by 23 May 2023.

E-cigarette samples

3. Seven e-cigarette samples were sourced from the Committee, and ten samples were sourced from state-wide compliance activities from government departments (Queensland Health and Queensland Police Service.
4. E-cigarette products marketed and sold in Queensland are not routinely assessed in relation to their quality or safety and are generally assessed for nicotine as a compliance measure.
5. The samples have been analysed by the Queensland Health FFS laboratory using available methods and a brief report of the results is provided (Attachment 2).

Report and findings

6. The report shows that:
   6.1. All 17 samples of e-liquid products analysed contained nicotine.
   6.2. Ingredients prohibited by the Therapeutic Goods Administration under their Standard for Nicotine Vaping Products TGO 110 were not ~~detected~~ initially detected using available laboratory methods.
   6.3. Testing with a different analysis method ~~did identify~~identified ~~find~~ benzaldehyde in two the seventeen samples tested, which is a prohibited under TGO 110.
   6.4. Further development of testing methods would be required to ascertain if samples contain prohibited ingredients above the detection limit set under TGO 110. This was not viable in the timeframe.
   6.5. All 17 samples contained various volatile organic compounds, typically used and produced in the manufacture of paints, pharmaceuticals, and refrigerants.
   6.6. All samples contained between five 5 to 15 heavy metals. A number of these heavy metals are considered toxic when inhaled including arsenic and zinc, these were detected in all samples.
7. A covering letter has been prepared from the Director-General to the Committee Chair (Attachment 1).

Commented [DW1]: In 2 of the 17 samples?

BACKGROUND

8. On 14 March 2023 the Legislative Assembly agreed to a motion that the Health and Environment Committee inquire into and report on reducing rates of e-cigarette use in Queensland. The Committee is due to table a report by 31 August 2023.
9. Public hearings on the Bill were conducted on 12 April 2023 in Townsville and 14 April 2023 in Brisbane.
10. At these public hearings the Committee has heard evidence and views from stakeholders on reducing e-cigarette use in Queensland.

Queensland Health
DIRECTOR-GENERAL BRIEFING NOTE

C-ECTF-23/3930
Strategy, Policy, and Reform

11. On 3 May 2023 the Department appeared alongside the Chief Health Officer at a public briefing at the request of the Committee to provide evidence on health impacts of e-cigarette use and information on current measures to monitor and reduce use.

RESULTS OF CONSULTATION

12. Prevention Strategy Branch liaised with Hospital and Health Services to obtain clearance to use samples of e-cigarettes that had previously been seized by the Unit.

RESOURCE/FINANCIAL IMPLICATIONS

13. There are no resource or financial implications associated with this brief.

HUMAN RIGHTS

14. Human rights are not engaged in providing analysis of the e-cigarette samples.

SENSITIVITIES/RISKS

15. There are no sensitivities or risks associated with this brief.

ATTACHMENTS

16. Attachment 1 - Letter from the Director-General to the Chair of the Committee
    Attachment 2 – Report on disposable e-cigarette

Author	**Cleared by (Dir/Snr Dir)**	**Content verified by (DDG/CE)**
Name: Rebecca Position: Advanced Health Promotion Officer Unit: Prevention Strategy Tel No: s.73 - Irrelevant information Date Drafted: 18 May 2023	Name: Mark Position: Executive Director Branch: Prevention Strategy Branch Tel No s.73 - Irrelevant information Date Cl 2023 **Note clearance contact is also key contact for brief queries**	Name: Jasmina Joldić Position: Associate Director-General Division: Strategy, Policy and Reform Tel No s.73 - Irrelevant Date Verified: XX May 2023

Queensland Health

Assessment of e-liquid composition

For the Queensland Parliament - Health & Environment Committee

1. Purpose

To assess the chemical composition of e-liquids that are currently in vaping products available in Queensland.

2. Scope

To analyse the chemical composition of seventeen (17) e-liquid samples currently available in the Queensland vape market.

Seven (7) e-liquid samples were sourced from Health & Environment Committee (the Committee) and ten (10) samples were sourced from state-wide compliance activities from government departments (Queensland Health and Queensland Police Service).

3. Background

E-cigarette products marketed and sold in Queensland are not assessed in relation to their quality or safety.

Public health concerns have been raised by the community and by health practitioners regarding the risks of vaping products and their aerosols. In addition to nicotine, liquids used in electronic cigarettes also contain other chemical additives which have the potential to pose serious health risks to users. E-liquids are reported to contain other chemical additives such as flavours, solvents, preservatives, and contaminants that may be harmful to health when inhaled as part of vaping.

4. Laboratory Analysis

The 17 e-liquid samples were analysed by Queensland Health Forensic and Scientific Services (QH FSS) using the available laboratory methods. Qualitative or quantitative analyses were undertaken for nicotine, prohibited substances under the Therapeutic Goods Administration's - Therapeutic Goods (Standard for Nicotine Vaping Products) (TGO 110) Order 2021 (TGO 110), and other substances of concern such as carbonyl compounds, volatile organic compounds (VOCs), pesticides/fungicides/herbicides, and heavy metals.

Commented [DW1]: VOCs defined here

Queensland Government

The detection limit for the analytes was determined by QHFSS based on its current analytical capability. This may vary from the compliance limits established for the substances.

5. Results and Discussion

The 17 samples were analyzed for nicotine and other substances of concern such as carbonyl compounds, VOCs, pesticides, and heavy metals, and eight substances that are prohibited ingredients in vapes under the TGO 110.

E-liquids are also known to contain other chemical additives (flavourings and preservatives) and contaminants that have the potential to pose a serious health risk to vape users. These chemical additives and contaminants typically include various carbonyl compounds, VOCs, and heavy metals.

The results of the 17 samples are discussed below.

5.1 Nicotine

Nicotine was found in all e-liquid samples, as shown in Table 1. The nicotine content ranged from trace levels (<200 mg/kg) to 47,000 mg/kg~~to trace levels~~.

Commented [DW2]: Agree

Under Queensland's *Medicines and Poisons Act 2019*, vaping devices containing nicotine may only be obtained at a pharmacy under the prescription of a medical practitioner. Such devices may contain up to 100 mg/ml (100,000 mg/kg) of nicotine. Vaping products which contain nicotine and are sourced from other retailers are illegal under the *Medicines and Poisons Act 2019*. As these samples were NOT obtained through a pharmacy via a prescription, **nicotine should not have been present in any samples.**

The capacity of e-cigarettes to deliver nicotine and other harmful chemicals into the body varies widely, ranging from very low to levels like that of cigarettes, depending on product characteristics, user inhalation behaviour, and nicotine solution concentration.

The health risks of nicotine include neurological, cardiovascular, respiratory (impaired lung function), renal, and reproductive health effects. In some cases, high levels of exposure can lead to death. Young children, adolescents, pregnant and breastfeeding mothers, and the elderly are considered the most vulnerable to nicotine exposure. According to the World Health Organisation, nicotine itself is not a carcinogen, however, it may function as a "tumor promoter". Nicotine seems involved in fundamental aspects of the biology of malignant diseases, and neurodegeneration.

4.2 Prohibited ingredients

There are eight chemical compounds listed as prohibited ingredients under the TGO 110. These include 2,3-pentanedione, acetoin, benzaldehyde, cinnamaldehyde, diacetyl, diethylene glycol, dl-alpha-tocopheryl acetate (Vit E), and ethylene glycol. The compliance limit set under the TGO 110 is less than 10 parts per million (ppm).

The laboratory analysis in **Table 2** revealed that none of the seventeen (17) samples contained prohibited ingredients above the laboratory limit of reporting (LoR) or limit of detection of 2000ppm. This limit ~~which~~ is significantly higher (x200) than the compliance limit set under the TGO 110.

Commented [DW3]: Agree

Further analysis would need to be undertaken to ascertain that the samples do not contain prohibited ingredients above the detection limit set under TGO 110.

It should be noted that using a different analytical method, which is used to assess carbonyls, benzaldehyde (carbonyl) was detected in two of the samples, at 28ppm and 66ppm (note 1 mg/kg = 1ppm). Benzaldehyde is a prohibited ingredient under TGO 110 with a compliance limit of <10 ppm, set by TGO 110.

There are known health risks associated with inhaling these prohibited ingredients identified in the TGO 110. These include irreversible lung damage; respiratory failure; toxicity of the brain, heart, and kidneys; and impairment of the immune cell function.

Table 1 - Nicotine

Lab Analysis (Limit of Reporting: 200 mg/kg)	IGET Bar Strawberry Watermelon Ice	Vorteke Melon	IGET Bar Strawberry Lemon Ice	IGET Legend Passionfruit Watermelon Ice	IGET Bar Grape Ice	IGET Bar Kiwi Pineapple Ice	IGET Legend Blueberry Blackberry Ice	HQD Cuvie Plus - Strawberry Watermelon	HQD Cuvie Plus – Passionfruit
Nicotine	Present	Present	Present	Present	Present	Present	Present	Present	Present
Concentration (mg/kg)	43,000	<200	45,000	47,000	47,000	45,000	44,000	38,000	44,000

Lab Analysis	IGET Bar - Peach Ice - 3500 puffs	IGET Bar - Blackberry Ice - 3500 puffs	IGET XXL - Lush Ice - 1800 puffs	IGET Goat - Cherry Ice - 5000 puffs	Gunnpod Meta - Gra Ice - 4500 puffs	Gunnpod Wave - Su Breeze - 3500 pu	IGET Mega - Strawberry Banana Ice - 3000 puffs	Waka Smash - Apple surge - 6000 puffs
Nicotine	Present	Present	Present	Present	Present	Present	Present	Present
Concentration (mg/kg)	37,000	33,000	<200	28,000	30,000	12,000	35,000	30,000

Table 2 – Prohibited substances under TGO 110

Vaping liquid Samples tested (Limit of Reporting 2000mg/kg except for Vitamin E acetate 50 mg/kg))	TGO110 - Prohibited Substances							
	2,4-Butadione	2,3-Pentadione	Acetoin	Benzaldehyde	Cinnamaldehyde	Vitamin E acetate	Ethylene glycol	Diethylene glycol
IGET Bar Strawberry Watermelon Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
Vorteke Melon	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar Strawberry Lemon Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Legend Passionfruit Watermelon Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar Grape Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar Kiwi Pineapple Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Legend Blueberry Blackberry Ice	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
HQD Cuvie Plus - Strawberry Watermelon	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
HQD Cuvie Plus – Passionfruit	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar - Peach Ice - 3500 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Bar - Blackberry Ice - 3500 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET XXL - Lush Ice - 1800 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Goat - Cherry Ice - 5000 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
Gunnpod Meta - Grape Ice - 4500 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
Gunnpod Wave - Summer Breeze - 3500 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
IGET Mega - Strawberry Banana Ice - 3000 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR
Waka Smash - Apple surge - 6000 puffs	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR	> LOR

Assessment of e-liquid composition – Queensland Health

5.3 Other Chemicals of Concern

5.3.1 Carbonyl compounds

All 17 samples of e-liquids were found to contain carbonyl compounds. All samples contained at least two carbonyl compounds (formaldehyde and acetaldehyde) and 16 samples contained acrolein.

Commented [DW4]: Agree

Carbonyl compounds are considered irritants of the mucosal tissue of the lungs. Some of these compounds are potentially harmful to health. For example, formaldehyde is classified as a Group 1 human carcinogen by the International Agency for Research on Cancer, and acetaldehyde is classified as possibly carcinogenic to humans (Group 2B); while acrolein causes irritation of the nasal cavity and damages the lining of the lungs.

5.3.2 Volatile Organic Compounds

VOCs are a class of organic compound chemicals (usually found in gaseous form) that are typically used and produced in the manufacture of paints, pharmaceuticals, and refrigerants.

All 17 samples contained various VOCs. Five VOCs are common to all 17 samples: propylene glycol, glycerin, 2-isopropyl-N,2,3-trimethylbutanamide, benzoic acid, and 3-hexene-1-ol.

Propylene glycol and glycerin are the main components of e-liquids. They are known to be hazardous when inhaled. Heating propylene glycol and glycerin in e-cigarettes produces lung disease hazards and inhaling these compounds makes the lungs vulnerable to infections. Breathing aerosolised propylene glycol can affect the risk of asthma development.

While some of the VOCs detected are not known to pose health risks, many of these have been flagged for critical health concerns. For example, methyl anthranilate (found in three products) and ethyl propanoate (found in one product) are suspected carcinogens and either a mutagen, skin sensitiser or toxic to reproduction. Further, neomenthol (found in 7 products) and ethyl lactate have also been suspected to be toxic to reproduction.

5.3.3 Heavy Metals

All samples contained between five to fifteen heavy metals. Arsenic and zinc were detected in all samples. Other toxic heavy metals identified include lead, mercury, nickel, chromium, antimony, aluminium, iron, nickel, barium, manganese, copper, strontium, and vanadium.

A number of these heavy metals are known to be carcinogenic, mutagenic, toxic to reproduction and development, and cause neurological anomalies. Arsenic and nickel are carcinogens, while chromium and nickel are linked to respiratory diseases. Manganese, lead, and mercury are known to cause neurological and developmental defects. Barium may cause kidney problems, while vanadium may be toxic to the respiratory system.

6. Summary of Results

Several chemical compounds detected in e-liquids tested as part of this analysis have been reported to pose serious health risks to vape users. The analysis identified that:

- All 17 samples of e-liquid products analysed contained nicotine. The nicotine content ranged from trace levels (<200 mg/kg) to 47,000 mg/kg.

- None of the 17 samples analysed recorded prohibited ingredients above the laboratory detection limit of 2000 ppm. The detection limit employed by QHFSS is significantly higher (x 200) than the compliance limit set under the TGO 110 which is less than 10 ppm.
- Using a different analysis method, benzaldehyde, which is a prohibited ingredient under TGO 110, was detected in two of the samples, at 28ppm and 66ppm which is above the limit set by TGO 110 (<10 ppm).
- All 17 samples contained various VOCs. Five (5) VOCs are common to all 17 samples.
- All samples contained between five 5 to 15 heavy metals. A number of these heavy metals are considered toxic when inhaled including arsenic and zinc, which were detected in all samples.