Natural Gas Condensates: Human health tier II assessment

13 February 2015

Chemicals in this assessment

Chemical Name in the Inventory	CAS Number
Natural gas condensates, petroleum	64741-47-5
Natural gas, petroleum, raw liquid mix	64741-48-6
Natural gas, condensates	68919-39-1
Natural gas, substitute, steam-reformed desulfurized naphtha	68955-32-8

Preface

This assessment was carried out by staff of the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) using the Inventory Multi-tiered Assessment and Prioritisation (IMAP) framework.

The IMAP framework addresses the human health and environmental impacts of previously unassessed industrial chemicals listed on the Australian Inventory of Chemical Substances (the Inventory).

The framework was developed with significant input from stakeholders and provides a more rapid, flexible and transparent approach for the assessment of chemicals listed on the Inventory.

Stage One of the implementation of this framework, which lasted four years from 1 July 2012, examined 3000 chemicals meeting characteristics identified by stakeholders as needing priority assessment. This included chemicals for which NICNAS already held exposure information, chemicals identified as a concern or for which regulatory action had been taken overseas, and chemicals detected in international studies analysing chemicals present in babies' umbilical cord blood.

Stage Two of IMAP began in July 2016. We are continuing to assess chemicals on the Inventory, including chemicals identified as a concern for which action has been taken overseas and chemicals that can be rapidly identified and assessed by using Stage One information. We are also continuing to publish information for chemicals on the Inventory that pose a low risk to human health or the environment or both. This work provides efficiencies and enables us to identify higher risk chemicals requiring assessment.

The IMAP framework is a science and risk-based model designed to align the assessment effort with the human health and environmental impacts of chemicals. It has three tiers of assessment, with the assessment effort increasing with each tier. The Tier I assessment is a high throughput approach using tabulated electronic data. The Tier II assessment is an evaluation of risk on a substance-by-substance or chemical category-by-category basis. Tier III assessments are conducted to address specific concerns that could not be resolved during the Tier II assessment.

These assessments are carried out by staff employed by the Australian Government Department of Health and the Australian Government Department of the Environment and Energy. The human health and environment risk assessments are conducted and published separately, using information available at the time, and may be undertaken at different tiers.

This chemical or group of chemicals are being assessed at Tier II because the Tier I assessment indicated that it needed further investigation.

For more detail on this program please visit:**www.nicnas.gov.au**

Disclaimer

ACRONYMS & ABBREVIATIONS

Grouping Rationale

The chemicals in this group are described as follows:

- Natural gas condensates, petroleum (CAS No. 64741-47-5): a complex combination of hydrocarbons separated as a liquid from natural gas in a surface separator by retrograde condensation. It consists mainly of hydrocarbons with carbon numbers predominantly ranging from C2 to C20. It is a liquid at atmospheric temperature and pressure (SciFinder). Boiling point was measured as 28–254 °C (US EPA, 2011).
- Natural gas, petroleum, raw liquid mix (CAS No. 64741-48-6): a complex combination of hydrocarbons separated as a liquid from natural gas in a gas recycling plant by processes such as refrigeration or absorption. It consists mainly of saturated aliphatic hydrocarbons with carbon numbers predominantly ranging from C2 through to C8 (SciFinder). Boiling point was measured to be -42–126 °C (US EPA, 2011).
- Natural gas, condensates (CAS No. 68919-39-1): a complex combination of hydrocarbons separated and/or condensed from natural gas during transportation and collected at the wellhead and/or from the production, gathering, transmission, and distribution pipelines in deeps, scrubbers, etc. It consists predominantly of hydrocarbons with carbon numbers predominantly ranging from C2 through to C8 (SciFinder). Boiling point was measured to be -42–139 °C (US EPA, 2011).
- Natural gas, substitute, steam-reformed desulfurized naphtha (CAS No. 68955-32-8): a complex combination obtained by steam-reforming desulfurised naphtha at high pressure in the presence of a nickel catalyst. It consists of hydrogen and hydrocarbons with carbon numbers predominantly ranging from C1 through to C3 (SciFinder).

The chemicals in this group are UVCB (unknown or variable compositions, complex reaction products and/or biological materials) chemicals containing complex mixtures of hydrocarbons. The carbon chain lengths in these chemicals range between C1 and C20, with a boiling point range of -42–254 °C (SciFinder; US EPA, 2011).

These chemicals are generated either at the oil wells when raw natural gas is initially separated, or are generated as by-products from processing raw natural gas (Government of Canada, 2014). These chemicals, with the exception of the chemical with CAS No. 68955-32-8, were previously identified to be category members of 'low-boiling point petroleum naphthas'; petroleum refinery streams used in blending gasoline that are volatile liquids at standard temperature and pressure (US EPA, 2011). It is expected that the following chemical classes, known as PONA chemicals, will be present as constituents in each chemical of the group:

- (P) normal and branched-chain paraffinic hydrocarbons;
- (O) olefinic hydrocarbons;
- (N) naphthenic hydrocarbons (cycloparaffins); and,
- (A) aromatic hydrocarbons (mainly alkylbenzenes), similar to the low boiling point petroleum naphthas (NICNAS).

It was previously reported that the aromatic composition in natural gas condensate samples consisted of benzene (up to 3.6 % w/w) and alkylbenzenes such as toluene (up to 5.8 % w/w), ethylbenzene (up to 5.5 % w/w), and xylenes (up to 5.5 % w/w) (Government of Canada, 2014). Benzene has a number of hazardous properties (NICNAS, 2001) and presents the highest concern compared to the other known constituents of the chemical due to the potential adverse effects on human health associated with the evaporative emissions of these chemicals.

Import, Manufacture and Use

Australian

Australian information is only available for one chemical in the group. The chemical with CAS No. 68919-39-1 has no identified uses, but is listed in the 2006 High Volume Industrial Chemicals List (HVICL) with a total reported volume of 100,000–999,999 tonnes.

International

The following international uses have been identified through:

- the European Union (EU) Registration, Evaluation and Authorisation of Chemicals (REACH) dossiers;
- Galleria Chemica;
- United States Environmental Protection Agency (US EPA) Screening-Level Hazard Characterization document: 'Gasoline Blending Streams Category'; and
- Government of Canada Draft Screening Assessment: Natural Gas Condensates.

The chemicals have reported commercial uses including::

- viscosity adjustors/diluents blended into heavy crude oil or bitumen; and/or
- distributed as natural gas for fuel formulations.

It was also reported that the chemical with CAS No. 64741-47-5 had site-limited use in oilfield applications such as well servicing, and in hydraulic fracturing operations (Government of Canada, 2014).

Restrictions

Australian

The chemicals in the low boiling point petroleum naphtha category are listed in the *Poisons Standard—the Standard for the Uniform Scheduling of Medicines and Poisons* (SUSMP) in Schedule 5 (SUSMP, 2014):

'HYDROCARBONS, LIQUID, including kerosene, diesel (distillate), mineral turpentine, white petroleum spirit, toluene, xylene and light mineral and paraffin oils (but excluding their derivatives), except:

(a) toluene and xylene when included in Schedule 6;

(b) benzene and liquid aromatic hydrocarbons when included in Schedule 7;

(c) food grade and pharmaceutical grade white mineral oils;

(d) in solid or semi-solid preparations;

(e) in preparations containing 25 per cent or less of designated solvents;

(f) in preparations packed in pressurised spray packs;

(g) in adhesives packed in containers each containing 50 grams or less of adhesive;

(h) in writing correction fluids and thinners for writing correction fluids packed in containers having a capacity of 20 mL or less; or

(i) in other preparations when packed in containers with a capacity of 2 mL or less.'

Schedule 5 chemicals are described as 'Substances with a low potential for causing harm, the extent of which can be reduced through the use of appropriate packaging with simple warnings and safety directions on the label.' Schedule 5 chemicals are labelled with 'Caution' (SUSMP, 2014).

International

All the chemicals in the group, except the chemical with CAS No. 68955-32-8, are listed on the EU Cosmetics Regulation 1223/2009 Annex II: List of substances prohibited in cosmetic products, if the chemicals contain >0.1 % benzene (CosIng).

Existing Worker Health and Safety Controls

Hazard Classification

The chemicals in this group, except for the chemical with CAS No. 68955-32-8, are classified as hazardous, with the following risk phrases for human health in the Hazardous Substances Information System (HSIS) (Safe Work Australia):

- Carc. Cat. 2; R45—May cause cancer
- Muta Cat. 2; R46—May cause heritable genetic damage
- Xn; R65—May cause lung damage if swallowed

The classifications for the chemicals with CAS Nos. 64741-47-5 and 64741-48-6 are subject to notes H and P. The classifications for the chemical CAS No. 68919-32-8 are subject to notes H and J.

'**Note H**: The classification and label shown for this substance applies to the dangerous property(ies) indicated by the Risk Phrase(s) in combination with the category(ies) of danger shown. The manufacturers, distributors and importers of this substance shall be obliged to carry out an investigation to make themselves aware of the relevant and accessible data which exists for all other properties to classify and label the substance.'

'**Note J**: The classification as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS no. 200-753-7). This note applies only to certain complex coal- and oil-derived substances in Annex I.'

'**Note P**: The classification as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS no. 200-753-7). When the substance is classified as a carcinogen or mutagen, Note E shall also apply. When the substance is not classified as a carcinogen or mutagen, at least the Safety Phrases (2-)23-24-62 shall apply. This note applies only to certain complex oil-derived substances in Annex I.'

'**Note E**: For substances ascribed Note E, the Risk Phrases R20, R21, R22, R23, R24, R25, R26, R27, R28 R39, R68 (harmful), R48 and R65 and all combinations of these Risk Phrases should be preceded by the word 'also'.'

Exposure Standards

Australian

No specific exposure standards are available for the chemicals. Benzene (CAS No. 71-43-2) has an exposure standard of 3.2 mg/m^3 (1 ppm) time weighted average (TWA).

International

No specific exposure standards are available for the chemicals. Benzene has a number of exposure standards available internationally (Galleria Chemica).

Health Hazard Information

The chemicals in this group include a large number of individual components, including linear and branched alkanes, alkenes and aromatic compounds. The aromatic compounds, in general, are more toxic than the aliphatic components. Of these, benzene (CAS No. 71-43-2) (NICNAS, 2001) has the highest toxicity and also serves as a marker for the aromatic content of these UVCBs.

Since there is no available hazard information specific to any members of this group, the hazards of reference chemicals with known PONA hydrocarbon content (US EPA, 2011) will be used as a read-across where appropriate. The reference chemicals used as markers were light alkylate naphtha (CAS No. 64741-66-8), light catalytic cracked naphtha (CAS No. 64741-55-5), heavy straight run naphtha (CAS No. 64741-41-9), and full range catalytic reformed naphtha (CAS No. 68955-35-1), respectively, for the paraffinic, olefinic, naphthenic, and aromatic hydrocarbon content of the 'low boiling point naphthas' (US EPA, 2011; Government of Canada, 2014; NICNAS).

Acute Toxicity

Oral

No data are available for the chemicals. The reference chemicals with CAS Nos. 64741-55-5, 64741-66-8, and 68955-35-1, have low acute oral toxicity based on results from animal tests with median lethal doses (LD50s) in Sprague Dawley (SD) rats reported to be >2000 mg/kg bw (Government of Canada, 2011; US EPA, 2011).

Dermal

No data are available for the chemicals. The reference chemicals have low acute dermal toxicity based on results from animal tests with LD50s in New Zealand White rabbits for CAS Nos. 64741-55-5 and 68955-35-1 reported to be >2000 mg/kg bw (Government of Canada, 2011; US EPA, 2011). No mortalities occurred at any doses for any of the reference chemicals specified above.

Inhalation

No data are available for the chemicals. The reference chemicals as vapour have moderate to high acute toxicity based on results from animal tests following inhalation exposure. The median lethal concentrations (LC50s) in SD rats for the chemicals with CAS Nos. 64741-55-5 and 64741-66-8 are >5.3 and 6.31 mg/L, respectively.

A hazard classification is warranted for the chemicals in this group based on the available information.

Corrosion / Irritation

Corrosivity

No data are available.

Respiratory Irritation

No data are available.

Skin Irritation

No data are available for the chemicals. The reference chemicals are shown to cause low to moderate skin irritation in animal studies. The chemicals identified with CAS Nos. 64741-55-5 (olefinic), 64741-66-8 (paraffinic) and 68955-35-1 (aromatic) are moderately irritating to rat or rabbit skin (US EPA, 2011).

The component chemical, benzene (CAS No. 71-43-2), is classified as hazardous with the risk phrase 'Irritating to skin' (R38) in the HSIS (Safe Work Australia). In humans, vapour levels >60 ppm have been associated with skin irritation, including second degree burns (NICNAS, 2001).

Reported concentrations of benzene in the natural gas condensates, up to 3.6 % (Government of Canada, 2011, 2013 & 2014), are not above the cut-off concentrations for classification for skin irritation (Safe Work Australia, 2004; GHS, 2009). Therefore, classification for skin irritation is not expected to be warranted for chemicals in this group (refer to **Recommendation** section).

Eye Irritation

No data are available for the chemicals. In eye irritation studies in rabbits, the reference chemicals were found to cause low to moderate eye irritation. The chemicals identified with CAS Nos. 64741-55-5 (olefinic) and 64741-66-8 (parafinic) were not irritating to rabbit eyes, whereas the chemical with CAS No. 68955-35-1 (aromatic) was moderately irritating to rabbit eyes (US EPA, 2011).

The component chemical, benzene, is classified as hazardous with the risk phrase 'Irritant: Irritating to eyes' (R36) in the HSIS (Safe Work Australia). Benzene vapours have been reported to cause eye irritation in humans and rats at concentrations ≥33 ppm and ≥10 ppm, respectively (NICNAS, 2001). Reported concentrations of benzene in the natural gas condensates, up to 3.6 % (Government of Canada, 2011 & 2013), are not above the cut-off concentrations for classification for eye irritation (Safe Work Australia, 2004; GHS, 2009). Therefore, classification for eye irritation is only warranted for this group if it can be demonstrated that the benzene content is above the cut-off concentration for this classification (refer to **Recommendation** section).

Sensitisation

Respiratory Sensitisation

No data are available.

Skin Sensitisation

No data are available for the chemicals. The reference chemicals were not found to induce dermal sensitisation when tested in guinea pigs in various skin sensitisation studies. The chemicals with CAS Nos. 64741-55-5 (olefinic), 64741-66-8 (paraffinic), and 68955-35-1 (aromatic) were found to be non-sensitising to guinea pig skin in the reported studies (US EPA, 2011).

Repeated Dose Toxicity

Oral

No data are available for the chemicals in this category. However, it is expected that benzene will be present as an aromatic component in the group.

Benzene (CAS No. 71-43-2), is classified as hazardous with the risk phrase 'Toxic: Danger of serious damage to health by prolonged exposure by inhalation, in contact with skin and if swallowed' (R48/23/24/25) in the HSIS (Safe Work Australia) (refer to **Repeat dose inhalation toxicity**).

Dermal

No data are available for the chemicals.

Occluded applications of the reference chemical CAS No. 64741-55-5 (olefinic) resulted in no treatment-related systemic effects from 28–90-day repeated dose toxicity studies in SD rats at doses up to 652 mg/kg bw/day (US EPA, 2011).

Studies in rabbits (strain not specified) for the reference chemical CAS No. 68955-35-1 (aromatic) reported the lowest observed adverse effect level (LOAEL) value of 1000 mg/kg bw/day (increased mortality) from 28-day repeated dermal dose toxicity studies (Government of Canada, 2011).

The component chemical, benzene (CAS No. 71-43-2), is classified as hazardous with the risk phrase 'Toxic: Danger of serious damage to health by prolonged exposure by inhalation, in contact with skin and if swallowed' (R48/23/24/25) in the HSIS (Safe Work Australia) (refer to **Repeat dose inhalation toxicity**).

Inhalation

No data are available for the chemicals.

In general, minimal systemic effects have been observed in rodents following 28–90-day whole body inhalation exposures to the reference chemicals CAS Nos. 64741-41-9 (naphthenic) and 64741-55-5 (olefinic) (Government of Canada, 2011; US EPA, 2011). The range of no observed adverse effect concentrations

(NOAECs) reported in these studies was 2.3–13.4 mg/L (US EPA, 2011). The systemic effects included renal effects (increased kidney weight and renal lesions such as tubule dilation), liver effects (increased liver weight), and haematological changes.

The component chemical, benzene (CAS No. 71-43-2), is classified as hazardous with the risk phrase 'Toxic: Danger of serious damage to health by prolonged exposure by inhalation, in contact with skin and if swallowed' (R48/23/24/25) in the HSIS (Safe Work Australia). This classification is based on bone marrow depression observed with repeated occupational exposure to benzene vapours at ≥7.6 ppm (0.024 mg/L) (NICNAS, 2001). The reported concentrations of benzene (US EPA, 2011; Government of Canada, 2011, 2013 & 2014) in the chemicals of the natural gas condensates category are, in some cases, above the cut-off concentrations for classification (Safe Work Australia, 2004; GHS, 2009). Therefore, classification for repeated dose toxicity could be warranted for some of the chemicals in this group (refer to **Recommendation** section).

Genotoxicity

The chemicals are classified as hazardous—Category 2 mutagenic substance—with the risk phrase 'May cause heritable genetic damage' (T; R46) in the HSIS (Safe Work Australia). This classification need not apply if it can be shown that the chemical contains less than 0.1 % w/w benzene. The available data for the natural gas condensates support the overall classification.

Several in vitro assays for some of the reference chemicals indicated the following mixed results (Government of Canada, 2011 & 2013; US EPA, 2011):

- positive results in chromosomal aberrations in mouse lymphoma assays with metabolic activation (doses up to 400 µg/mL for the chemical with CAS No. 68955-35-1);
- negative results in chromosomal aberrations in mouse lymphoma assays with and without metabolic activation (the chemicals with CAS Nos. 64741-55-5 and 64741-66-8); and,
- equivocal for sister chromatid exchange (SCE) in Chinese hamster ovary (CHO) cells without metabolic activation (the chemicals with CAS No. 64741-55-5).

The chemicals gave negative results in several in vivo genotoxicity assays, which included induction of bone marrow chromosomal aberration of SD rats (inhalation exposure and intraperitoneal (i.p.) injection of the chemical with CAS No. 64741-55-5 (olefinic); i.p. injection of the chemicals with CAS Nos. 64741-66-8 (paraffinic) and 68955-35-1 (aromatic)).

The component chemical, benzene, is classified as hazardous—Category 2 mutagenic substance—with the risk phrase 'May cause heritable genetic damage' (T; R46) in the HSIS (Safe Work Australia). Reported concentrations of benzene in the natural gas condensates, up to 3.6 % (Government of Canada, 2011, 2013 & 2014) are, in many cases, above the cut-off concentrations for classification (Safe Work Australia, 2004; GHS, 2009). Therefore, classification for genotoxicity could be warranted for most of the chemicals in this group (refer to **Recommendation** section).

Carcinogenicity

The majority of the chemicals are classified as hazardous—Category 2 carcinogenic substance—with the risk phrase 'May cause cancer' (T; R45) in the HSIS (Safe Work Australia). This classification need not apply if it can be shown that the chemical contains less than 0.1 % w/w benzene. The available data for the reference chemicals support the overall classification of the natural gas condensates.

The chemical with CAS No. 64741-55-5 (olefinic) was carcinogenic in C3H mice at unspecified doses. The studies reported increased incidences of malignant dermal neoplasms, which included squamous cell carcinomas and fibrosarcomas (US EPA, 2011). No other details were provided.

The chemical with CAS No. 64741-66-8 (paraffinic) was negative in lifetime carcinogenicity studies in C3H mice (US EPA, 2011).

The component chemical, benzene, is classified as hazardous—Category 1 carcinogenic substance—with the risk phrase 'May cause cancer' (T; R45) in the HSIS (Safe Work Australia). Reported concentrations of benzene in the natural gas condensates, up to 3.6 % (Government of Canada, 2011, 2013 & 2014) are, in many cases, above the cut-off concentrations for classification (Safe Work Australia, 2004; GHS, 2009). Therefore, classification for carcinogenicity could be warranted for some of the chemicals in the group (refer to **Recommendation** section).

Reproductive and Developmental Toxicity

No data are available for the chemicals. The reference chemicals are not reproductive or developmental toxic.

In several combined reproductive/developmental toxicity screening tests, SD rats exposed by inhalation to the chemicals with CAS Nos. 64741-41-9, 64741-55-5, and 64741-66-8 showed no adverse effects on reproductive and developmental toxicity parameters at doses up to 13.4, 23.9, and 25 mg/L, respectively (Government of Canada, 2011; US EPA, 2011).

Risk Characterisation

Critical Health Effects

The critical health effects of the chemicals are dependent on their composition, particularly the concentration of benzene. Effects include systemic long-term effects (carcinogenicity and mutagenicity) and systemic acute effects (acute toxicity from inhalation exposure, skin and eye irritation). The chemicals could also cause harmful effects following repeated oral, dermal and inhalation exposure. Components other than benzene are associated with a range of hazardous properties. However, exposure to chemicals of this group is expected to be very limited, and so only the components with the most severe effects are expected to contribute to the likely risk.

Public Risk Characterisation

Given the uses identified for these chemicals, it is unlikely that the public will be exposed. Hence, the public risk from these chemicals is not considered to be unreasonable.

There is limited general population exposure to unintentional releases of the gasoline blending constituents in the vicinity of petroleum refineries. These releases are likely to contribute to ambient background levels of hazardous components such as benzene. However, industrial emissions of benzene are not considered a significant source of public exposure (NICNAS, 2001).

Companies introducing and processing the chemicals are likely to implement control measures to reduce fugitive emissions on site as a consequence of several occupational and environmental legislative requirements, such as licence conditions and occupational exposure standards. Based on data reported to the National Pollutant Inventory for Australian refineries, fugitive emissions of volatile organic compounds have generally reduced over the past few years (NPI). Domestic or commercial uses that could give rise to public exposure are listed on Schedule 5 in the *Poisons Standard*.

Occupational Risk Characterisation

Given that the chemicals are typically consumed, or undergo further processing, in closed systems, limited occupational exposure is expected.

Given the critical systemic acute and chronic health effects, the chemicals could pose an unreasonable risk to workers unless adequate control measures to minimise dermal, ocular and inhalation exposure are implemented. The chemicals should be appropriately classified and labelled to ensure that a person conducting a business or undertaking (PCBU) at a workplace (such as an employer) has adequate information to determine the appropriate controls.

Any air monitoring should include benzene.

The data available support an amendment to the hazard classification in the HSIS (refer to **Recommendation** section).

NICNAS Recommendation

Assessment of these chemicals is considered to be sufficient, provided that the recommended amendments to the classification are adopted, and labelling and all other requirements are met under workplace health and safety and poisons legislation as adopted by the relevant state or territory.

Companies introducing or processing the chemicals should continually seek to reduce fugitive emissions as far as reasonably practicable.

Regulatory Control

Work Health and Safety

Although the chemicals are classified as UVCBs, the producers of these chemicals may have constituent profiles and compositions for each chemical in the group. If this is the case, then the hazards of the UVCBs and the appropriate classification(s) should be determined based on the application of the relevant formulae for the classification of mixtures (Safe Work Australia, 2004).

The chemicals are recommended for classification and labelling under the current Approved Criteria and adopted GHS as below. This assessment does not consider classification of physical and environmental hazards.

For skin and eye irritation and chronic health effects, the classification will be dependent on the concentration of benzene as follows.

Irritation/Corrosivity

In the absence of specific test data, the classification should be determined based on the levels of benzene.

Repeated dose toxicity

In the absence of specific test data, the classification should be determined based on the levels of benzene.

Genotoxicity

In the absence of specific test data, the classification should be determined based on the levels of benzene.

Carcinogenicity

In the absence of specific test data, the classification should be determined based on the levels of benzene.

The relevant formulae for the classification of mixtures (Safe Work Australia, 2004) should be applied to benzene, based on its concentration in these UVCB substances. The classifications below represent the highest possible classifications for each endpoint under these rules. Should empirical data become available for any member of the group indicating that a lower (or higher) classification is appropriate for the specific chemical, this may be used to amend the default classification for that chemical.

Hazard	Approved Criteria (HSIS)[a]	GHS Classification (HCIS)[b]

Hazard	Approved Criteria (HSIS)[a]	GHS Classification (HCIS)[b]
Acute Toxicity	Harmful: may cause lung damage if swallowed (Xn; R65)*	May be fatal if swallowed and enters airways - Aspi. Cat. 1 (H304)
Irritation / Corrosivity	Irritating to eyes (Xi; R36) Irritating to skin (Xi; R38)	Causes serious eye irritation - Cat. 2A (H319) Causes skin irritation - Cat. 2 (H315)
Repeat Dose Toxicity	Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed (T; R48/23/24/25)	Causes damage to organs through prolonged or repeated exposure - Cat. 1 (H372)
Genotoxicity	Muta. Cat 2 - May cause heritable genetic damage (T; R46)*	May cause genetic defects - Cat. 1B (H340)
Carcinogenicity	Carc. Cat 2 - May cause cancer (T; R45)*	May cause cancer - Cat. 1B (H350)

[a] Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(2004)].

[b] Globally Harmonized System of Classification and Labelling of Chemicals (GHS) United Nations, 2009. Third Edition.

[*] Existing Hazard Classification. No change recommended to this classification

Advice for industry

Control measures

Control measures to minimise the risk from dermal, ocular, and inhalation exposure to the chemicals should be implemented in accordance with the hierarchy of controls. Approaches to minimise risk include substitution, isolation and engineering controls. Measures required to eliminate, or minimise risk arising from storing, handling and using a hazardous chemical depend on the physical form and the manner in which the chemicals are used. Examples of control measures which could minimise the risk include, but are not limited to:

- using closed systems or isolating operations;
- using local exhaust ventilation to prevent the chemicals from entering the breathing zone of any worker;
- health monitoring for any worker who is at risk of exposure to the chemicals, if valid techniques are available to monitor the effect on the worker's health;
- air monitoring to ensure control measures in place are working effectively and continue to do so;
- minimising manual processes and work tasks through automating processes;
- work procedures that minimise splashes and spills;
- regularly cleaning equipment and work areas; and
- using protective equipment that is designed, constructed, and operated to ensure that the worker does not come into contact with the chemicals.

Guidance on managing risks from hazardous chemicals are provided in the *Managing risks of hazardous chemicals in the workplace—Code of practice* available on the Safe Work Australia website.

Personal protective equipment should not solely be relied upon to control risk and should only be used when all other reasonably practicable control measures do not eliminate or sufficiently minimise risk. Guidance in selecting personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

Obligations under workplace health and safety legislation

Information in this report should be taken into account to help meet obligations under workplace health and safety legislation as adopted by the relevant state or territory. This includes, but is not limited to:

- ensuring that hazardous chemicals are correctly classified and labelled;
- ensuring that (material) safety data sheets ((M)SDS) containing accurate information about the hazards (relating to both health hazards and physicochemical (physical) hazards) of the chemicals are prepared; and
- managing risks arising from storing, handling and using a hazardous chemical.

Your work health and safety regulator should be contacted for information on the work health and safety laws in your jurisdiction.

Information on how to prepare an (M)SDS and how to label containers of hazardous chemicals are provided in relevant codes of practice such as the *Preparation of safety data sheets for hazardous chemicals—Code of practice* and *Labelling of workplace hazardous chemicals—Code of practice*, respectively. These codes of

practice are available from the Safe Work Australia website.

A review of the physical hazards of these chemicals has not been undertaken as part of this assessment.

References

Chemical Abstracts Service (SciFinder) a division of the American Chemical Sociey. Accessed January 2015 at **http://www.cas.org/products/scifinder**

Cosmetic Ingredients and Substances (CosIng). Accessed January 2015 at **http://ec.europa.eu/consumers/cosmetics/cosing/**

Galleria Chemica. Accessed January 2015 at **http://jr.chemwatch.net/galleria/**

Globally Harmonised System of Classification and Labelling of Chemicals (GHS) United Nations, 2009. Third edition. Accessed at **http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html**

Government of Canada 2011. Final Screening Assessment Petroleum Sector Stream Approach : Low Boiling Point Naphthas [Site-Restricted]. Accessed January 2015 at **http://www.ec.gc.ca/ese-ees/default.asp?lang=En&n=82F527F8-1**.

Government of Canada 2013. Final Screening Assessment Petroleum Sector Stream Approach : Low Boiling Point Naphthas [Industry-Restricted]. Accessed January 2015 at **http://www.ec.gc.ca/ese-ees/default.asp?lang=En&n=A9A9EED7-1**.

Government of Canada 2014. Draft Screening Assessment Petroleum Sector Stream Approach : Natural Gas Condensates. Accessed January 2015 at **http://www.ec.gc.ca/ese-ees/default.asp?lang=En&n=7933A3C7-1**

National Industrial Chemicals Notification and Assessment Scheme (NICNAS). Inventory Multi-Tiered and Prioritisation (IMAP) Human Health Tier II Assessment for Low Boiling Point Petroleum Naphthas. Available at **http://www.nicnas.gov.au**

National Pollutant Inventory (NPI). Accessed January 2015 at **http://www.npi.gov.au/index.html**

NICNAS (2001) Priority Existing Chemical Report for Benzene, September 2001. Electronic version for the web, accessed in January 2015 at **www.nicnas.gov.au**.

NICNAS 2006. Australian High Volume Industrial Chemicals List (AHVICL). Accessed January 2015 at **http://www.nicnas.gov.au/__data/assets/pdf_file/0019/6661/NICNAS_AHVICL_2006_PDF.pdf**

REACH Dossiers. Accessed January 2015 at **http://echa.europa.eu/web/guest/information-on-chemicals/registered-substances**

Safe Work Australia (SWA). Approved Criteria for Classifying Hazardous Substances, 3rd Edition [NOHSC: 1008 (2004)]. Accessed January 2015 at **http://www.safeworkaustralia.gov.au/sites/SWA/about/Publications/Documents/258/ApprovedCriteria_Classifying_Hazardous_Substances_NOHSC1008-2004_PDF.pdf**

Safe Work Australia (SWA). Hazardous Substances Information System (HSIS). Accessed January 2015 at **http://hsis.safeworkaustralia.gov.au/HazardousSubstance**

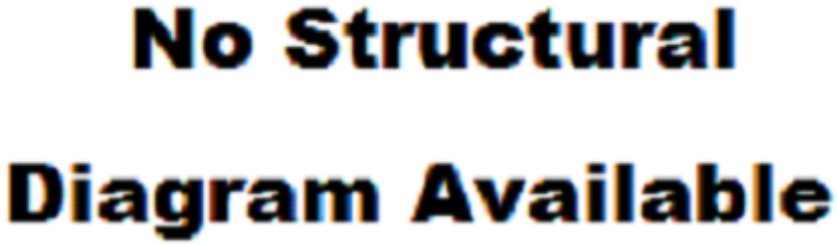
The Poisons Standard (the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)) 2014. Accessed January 2015 at **http://www.comlaw.gov.au/Details/F2014L01343**

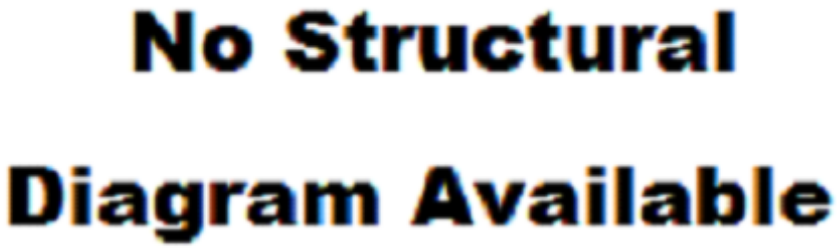
U.S. Environmental Protection Agency (2011) Screening-Level Hazard Characterization. Gasoline Blending Streams Category. Accessed on January 2015 at **http://www.epa.gov/chemrtk/hpvis/hazchar/Category_Gasoline%20Blending%20Streams_December_2011.pdf**

Last Update 13 February 2015

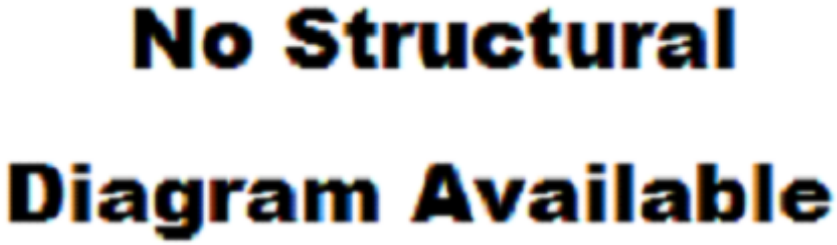
Chemical Identities

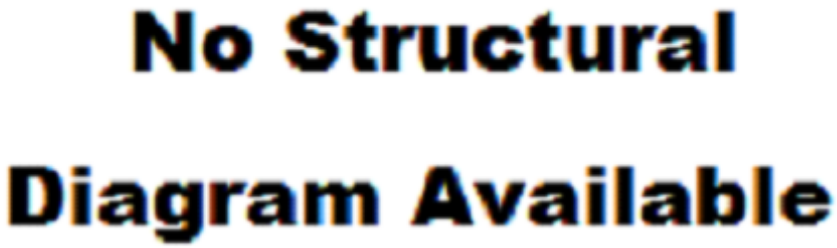
Chemical Name in the Inventory and Synonyms	**Natural gas condensates, petroleum**
CAS Number	64741-47-5
Structural Formula	

	
Molecular Formula	Unspecified
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Natural gas, petroleum, raw liquid mix** Natural gas, liquids
CAS Number	64741-48-6
Structural Formula	
Molecular Formula	Unspecified
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Natural gas, condensates** Condensate, natural gas
CAS Number	68919-39-1
Structural Formula	

	
Molecular Formula	Unspecified
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Natural gas, substitute, steam-reformed desulfurized naphtha** Substitute natural gas
CAS Number	68955-32-8
Structural Formula	
Molecular Formula	Unspecified
Molecular Weight	

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