HALLIBURTON

SAFETY DATA SHEET

according to Regulation (EC) No. 453/2010

AQLB-2

Revision Date: 22-Sep-2014 **Revision Number:** 5

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product Identifier

Product Name AQLB-2

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Additive

Sector of use Refer to the Annex for a listing of uses.

1.3. Details of the supplier of the safety data sheet

Halliburton Energy Services
Halliburton House, Howemoss Place
Kirkhill Industrial Estate
Dyce
Aberdeen, AB21 0GN
United Kingdom

Emergency Phone Number: +44 1224 795277 or +1 281 575 5000

www.halliburton.com

For further information, please contact

E-Mail address: fdunexchem@halliburton.com

1.4. Emergency telephone number

+44 1224 795277 or +1 281 575 5000

Emergency telephone - §45 - (EC)1272/2008	
Europe	**112**
Croatia	Centar za kontrolu otrovanja (CKO): (+385 1) 23-48-342 (Poison Control Center (PCC) - Institute for Medical Research and Occupational Health)
Denmark	Poison Control Hotline (DK): +45 82 12 12 12
France	ORFILA (FR): + 01 45 42 59 59
Germany	Poison Center Berlin (DE): +49 030 30686 790
Italy	Poison Center, Milan (IT): +39 02 6610 1029
Netherlands	National Poisons Information Center (NL): +31 30 274 88 88 (NB: this service is only available to health professionals)
Norway	Poisons Information (NO):+ 47 22 591300
Poland	Poison Control and Information Centre, Warsaw (PL): +48 22 619 66 54; +48 22 619 08 97
Spain	Poison Information Service (ES): +34 91 562 04 20
United Kingdom	NHS Direct (UK): +44 0845 46 47

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

REGULATION (EC) No 1272/2008

Acute Oral Toxicity	Category 4 - (H302)
Acute Inhalation Toxicity - Vapors	Category 4 - (H332)
Skin Corrosion / irritation	Category 1 - (H314)
Serious Eye Damage / Eye Irritation	Category 1 - (H318)
Flammable liquids.	Category 3 - (H226)

Classification according to EU Directives 67/548/EEC or 1999/45/EC
For the full text of the R-phrases mentioned in this Section, see Section 16

Classification
C - Corrosive.
Xn - Harmful.

Risk Phrases
R10 Flammable.
R35 Causes severe burns.
R20/22 Harmful by inhalation and if swallowed.

2.2. Label Elements

Hazard Pictograms

Signal Word **Danger**

Hazard Statements
H226 - Flammable liquid and vapor
H302 - Harmful if swallowed
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
H332 - Harmful if inhaled

Precautionary Statements - EU (§28, 1272/2008)
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P363 - Wash contaminated clothing before reuse
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P310 - Immediately call a POISON CENTER or doctor/physician
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

Contains

Substances	**CAS Number**
Acetic anhydride	108-24-7
Acetic acid	64-19-7

2.3. Other Hazards

None known

SECTION 3: Composition/information on Ingredients

Substances	EINECS	CAS Number	PERCENT (w/w)	EEC Classification	EU - CLP Substance Classification	REACH No.

Acetic anhydride	203-564-8	108-24-7	60 - 100%	R10 Xn; R20/22 C; R34	Acute Tox. 4 (H302) Acute Tox. 4 (H332) Skin Corr. 1B (H314) Eye Dam. 1 (H318) Flam. Liq. 3 (H226)	01-2119486470-36
Acetic acid	200-580-7	64-19-7	30 - 60%	R10 C; R35	Skin Corr. 1A (H314) Eye Dam. 1 (H318) STOT-SE 3 (H335) Flam. Liq. 3 (H226)	01-2119475328-30

For the full text of the R-phrases mentioned in this Section, see Section 16

3.1. Substances Not applicable
3.2. Mixtures Mixture

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

Eyes In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

Skin In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse. Destroy or properly dispose of contaminated shoes.

Ingestion Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

4.2. Most Important symptoms and effects, both acute and delayed

May cause eye and skin burns. May cause respiratory irritation May be harmful if swallowed. May be harmful if inhaled

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically

SECTION 5: Firefighting Measures

5.1. Extinguishing media

Suitable Extinguishing Media

Carbon dioxide, dry chemical, foam.

Extinguishing media which must not be used for safety reasons

Water must not be used with open containers.

5.2. Special hazards arising from the substance or mixture

Special Exposure Hazards

May be ignited by heat, sparks or flames. Closed containers may explode in fire. Decomposition in fire may produce toxic gases. Reaction with water may be highly exothermic.

5.3. Advice for firefighters

Special Protective Equipment for Fire-Fighters

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment.
See Section 8 for additional information

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up

Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Neutralize to pH of 6-8. Scoop up and remove.

6.4. Reference to other sections

See Section 8 and 13 for additional information.

SECTION 7: Handling and Storage

7.1. Precautions for Safe Handling

Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice

7.2. Conditions for safe storage, including any incompatibilities

Store away from alkalis. Store away from oxidizers. Store away from water. Keep from heat, sparks, and open flames. Keep container closed when not in use. Store in a cool well ventilated area. Store locked up. Product has a shelf life of 60 months.

7.3. Specific End Use(s)

Exposure Scenario Please refer to the attached Annex for a listing of exposure scenarios.

Other Guidelines No information available

SECTION 8: Exposure Controls/Personal Protection

8.1. Control parameters

Exposure Limits

Substances	CAS Number	EU	UK OEL	Netherlands	France OEL
Acetic anhydride	108-24-7	Not applicable	STEL: 2 ppm STEL: 10 mg/m³ TWA: 0.5 ppm TWA: 2.5 mg/m³	2,5 mg/m³	Not applicable
Acetic acid	64-19-7	10 ppm	Not applicable	Not applicable	10 ppm

Substances	CAS Number	Germany MAK/TRK	Spain	Portugal	Finland
Acetic anhydride	108-24-7	TWA: 5 ppm TWA: 21 mg/m³ MAK: 5 ppm MAK: 21 mg/m³	VLA-ED: 5 ppm VLA-ED: 21 mg/m³	TWA: 5 ppm	STEL: 5 ppm STEL: 21 mg/m³
Acetic acid	64-19-7	TWA: 10 ppm TWA: 25 mg/m³ MAK: 10 ppm MAK: 25 mg/m³	15 ppm VLA-EC; 37 mg/m³ VLA-EC VLA-ED: 10 ppm VLA-ED: 25 mg/m³	STEL: 15 ppm TWA: 10 ppm	STEL: 10 ppm STEL: 25 mg/m³ TWA: 5 ppm TWA: 13 mg/m³

Substances	CAS Number	Austria	Ireland	Switzerland	Norway
Acetic anhydride	108-24-7	Not applicable	Not applicable	Not applicable	Not applicable
Acetic acid	64-19-7	Not applicable	Not applicable	Not applicable	STEL: 20 ppm STEL: 37.5 mg/m³ TWA: 10 ppm TWA: 25 mg/m³

Substances	CAS Number	Italy	Poland	Hungary	Czech Republic
Acetic anhydride	108-24-7	Not applicable	NDS: 10 mg/m³	TWA: 20 mg/m³ STEL: 20 mg/m³	TWA: 4 mg/m³
Acetic acid	64-19-7	10 ppm	NDSCh: 30 mg/m³ NDS: 15 mg/m³	TWA: 25 mg/m³ STEL: 25 mg/m³	TWA: 25 mg/m³

Substances	CAS Number	Denmark
Acetic anhydride	108-24-7	Not applicable
Acetic acid	64-19-7	TWA: 10 ppm TWA: 25 mg/m³

Derived No Effect Level (DNEL)

Worker

Substances	Long-term exposure - systemic effects, Inhalation	Acute / short term exposure - systemic effects, Inhalation	Long-term exposure - local effects, Inhalation	Acute / short term exposure - local effects, Inhalation	Long-term exposure - systemic effects, Dermal	Acute / short term exposure - systemic effects, Dermal	Long-term exposure - local effects, Dermal	Acute / short term exposure - local effects, Dermal	Hazards for the eyes - local effects
Acetic anhydride	4.2 mg/m³	Not available	4.2 mg/m³	12.6 mg/m³	Not available	Not available	Not available	Not available	Not available
Acetic acid	Not available	Not available	25 mg/m³	25 mg/m³	Not available	Not available	Not available	Not available	Not available

General Population

Substances	Long-term exposure - systemic effects, Inhalation	Acute / short term exposure - systemic effects, Inhalation	Long-term exposure - local effects, Inhalation	Acute / short term exposure - local effects, Inhalation	Long-term exposure - systemic effects, Dermal	Acute / short term exposure - systemic effects, Dermal	Long-term exposure - local effects, Dermal	Acute / short term exposure - local effects, Dermal	Long-term exposure - systemic effects, Oral	Acute / short term exposure - local effects, Oral	Hazards for the eyes - local effects
Acetic acid	Not available	Not available	25 mg/m³	25 mg/m³	Not available	Not available	Not available	Not available	Not available	Not available	Not available

Predicted No Effect Concentration (PNEC)

Substances	Freshwater	Marine water	Intermittent release	Sewage treatment plant	Sediment (freshwater)	Sediment (marine water)	Air	Soil	Secondary poisoning
Acetic anhydride	3.06 mg/L	0.306 mg/L	30.58 mg/L	115 mg/L	11.4 mg/kg (wet)	1.14 mg/kg (wet)	Not available	0.478 mg/kg (wet)	Not available
Acetic acid	3.06 mg/l	0.306 mg/l	30.58 mg/l	85 mg/l	11.4 mg/kg	1.14 mg/kg	Not available	0.478 mg/kg	Not available

8.2. Exposure controls

Engineering Controls Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

Personal protective equipment

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional.
Organic vapor/acid gas respirator.

Hand Protection Chemical-resistant protective gloves (EN 374) Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374): Butyl rubber gloves. (>= 0.7 mm thickness)
This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced. Manufacturer's directions for use should be observed because of great diversity of types.

Skin Protection Rubber boots. Full protective chemical resistant clothing.

Eye Protection Chemical goggles; also wear a face shield if splashing hazard exists.

Other Precautions Eyewash fountains and safety showers must be easily accessible.

Environmental Exposure Controls No information available

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Liquid **Color:** Clear colorless
Odor: Pungent acrid **Odor Threshold:** No information available

Property	Values	Remarks/ - Method
pH:	< 2	
Freezing Point/Range	-9 °C	

Melting Point/Range	No data available
Boiling Point/Range	126 °C
Flash Point	39 °C PMCC
upper flammability limit	19
lower flammability limit	3
Evaporation rate	0.97
Vapor Pressure	11.7 mmHg
Vapor Density	3.5
Specific Gravity	1.0753
Water Solubility	Soluble in water
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No information available
Oxidizing Properties	No information available

9.2. Other information

VOC Content (%) No data available

SECTION 10: Stability and Reactivity

10.1. Reactivity

Not applicable

10.2. Chemical Stability

Stable

10.3. Possibility of Hazardous Reactions

Will Not Occur

10.4. Conditions to Avoid

Keep away from heat, sparks and flame. Do not allow water to get into container because of violent reaction.

10.5. Incompatible Materials

Strong alkalis. Strong oxidizers. Reacts with water.

10.6. Hazardous Decomposition Products

Carbon monoxide and carbon dioxide.

SECTION 11: Toxicological Information

11.1. Information on Toxicological Effects

Acute Toxicity

Inhalation	Causes severe respiratory irritation.
Eye Contact	Causes severe eye burns.
Skin Contact	Causes severe burns.
Ingestion	Causes burns of the mouth, throat and stomach.

Chronic Effects/Carcinogenicity Prolonged, excessive exposure may cause erosion of the teeth.

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Acetic anhydride	108-24-7	630 mg/kg (Rat)	4000 mg/kg (Rabbit)	4.2 mg/L (Rat) 4 h 1000 ppm (Rat) 4 h LC100: 1670 mg/m³ (Rat) 6h
Acetic acid	64-19-7	3310 mg/kg (Rat) 600 mg/kg (Rabbit) 4960 mg/kg (Mouse)	1060 mg/kg (Rabbit)	11.4 mg/L (Rat) 4 h

Substances	CAS Number	Skin corrosion/irritation
Acetic anhydride	108-24-7	Corrosive to skin
Acetic acid	64-19-7	Corrosive to skin

Substances	CAS Number	Eye damage/irritation

Acetic anhydride	108-24-7	Corrosive to eyes
Acetic acid	64-19-7	Corrosive to eyes

Substances	CAS Number	Skin Sensitization
Acetic anhydride	108-24-7	Not applicable due to corrosivity of the substance.
Acetic acid	64-19-7	Not applicable due to corrosivity of the substance.

Substances	CAS Number	Respiratory Sensitization
Acetic anhydride	108-24-7	No information available
Acetic acid	64-19-7	No information available

Substances	CAS Number	Mutagenic Effects
Acetic anhydride	108-24-7	In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects.
Acetic acid	64-19-7	In vivo tests did not show mutagenic effects. In vitro tests did not show mutagenic effects

Substances	CAS Number	Carcinogenic Effects
Acetic anhydride	108-24-7	No information available.
Acetic acid	64-19-7	Did not show carcinogenic effects in animal experiments

Substances	CAS Number	Reproductive toxicity
Acetic anhydride	108-24-7	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments.
Acetic acid	64-19-7	Did not show teratogenic effects in animal experiments.

Substances	CAS Number	STOT - single exposure
Acetic anhydride	108-24-7	May cause respiratory irritation.
Acetic acid	64-19-7	May cause respiratory irritation.

Substances	CAS Number	STOT - repeated exposure
Acetic anhydride	108-24-7	No significant toxicity observed in animal studies at concentration requiring classification.
Acetic acid	64-19-7	No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	Aspiration hazard
Acetic anhydride	108-24-7	Not applicable
Acetic acid	64-19-7	Not applicable

SECTION 12: Ecological Information

12.1. Toxicity

Ecotoxicity Effects

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Acetic anhydride	108-24-7	EC50(72h): > 1000 mg/L (>300.82 mg/L acetate ion) (growth rate) (Skeletonema costatum) (similar substance)	LC50: 265 mg/L (Leuciscus idus) LC50(96h): > 1000 mg/L (>300.82 mg/L acetate ion) (Oncorhynchus mykiss) (similar substance)	NOEC(16h): 1150 mg/L (Pseudomonas putida) (similar substance)	EC50(48h): 55 mg/L (Daphnia magna) EC50(48h): > 1000 mg/L (>300.82 mg/L acetate ion) (Daphnia magna) (similar substance) NOEC(21d): 31.4 - 37.9 mg/L (Daphnia magna) (reproduction) (similar substance – acetic acid)

Acetic acid	64-19-7	EC50: 90 mg/L (Microcystis aeruginosa) EC50(72h): > 1000 mg/L (>300.82 mg/L – acetate ion) (Skeletonema costatum)	LC50: 79 mg/l (Pimephales promelas) LC50: 75 mg/l (Pimephales promelas) LC50(96h) > 1000 mg/L (>300.82 mg/L – acetate ion) (Oncorhynchus mykiss)	NOEC(16h): 1150 mg/L (Pseudomonas putida)	EC50: 47 mg/l (Daphnia magna) LC50: 32 mg/L (Artemia salina) EC50(48h) > 1000 mg/L (>300.82 mg/L – acetate ion) (Daphnia magna) NOEC(21d): 31.4 - 37.9 mg/L (Daphnia magna) (reproduction)

12.2. Persistence and degradability

Readily biodegradable

Substances	CAS Number	Persistence and Degradability
Acetic anhydride	108-24-7	Readily biodegradable (99% @ 28d)
Acetic acid	64-19-7	Readily biodegradable (> 95% @ 28d)

12.3. Bioaccumulative potential

Does not bioaccumulate

Substances	CAS Number	Log Pow
Acetic anhydride	108-24-7	-0.58 BCF 3.16 (Calculated)
Acetic acid	64-19-7	-0.17 BCF 3.16 (Calculated)

12.4. Mobility in soil

No information available

12.5. Results of PBT and vPvB assessment

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).

12.6. Other adverse effects

Endocrine Disruptor Information

This product does not contain any known or suspected endocrine disruptors

SECTION 13: Disposal Considerations

13.1. Waste treatment methods

Disposal Method

Disposal should be made in accordance with federal, state, and local regulations. Incineration recommended in approved incinerator according to federal, state, and local regulations. Substance should NOT be deposited into a sewage facility.

Contaminated Packaging

Follow all applicable national or local regulations. Contaminated packaging may be disposed of by: rendering packaging incapable of containing any substance, or treating packaging to remove residual contents, or treating packaging to make sure the residual contents are no longer hazardous, or by disposing of packaging into commercial waste collection.

SECTION 14: Transport Information

IMDG/IMO

UN Number: UN2920
UN Proper Shipping Name: Corrosive Liquid, Flammable, N.O.S. (Contains Acetic Anhydride, Acetic Acid)
Transport Hazard Class(es): 8
Subsidiary Hazard: (3)
Packing Group: II
Environmental Hazards: Not applicable
EMS: EmS F-E, S-C

RID

UN Number: UN2920
UN Proper Shipping Name: Corrosive Liquid, Flammable, N.O.S. (Contains Acetic Anhydride, Acetic Acid)
Transport Hazard Class(es): 8
Subsidiary Hazard: (3)

Packing Group:	II
Environmental hazard:	Not applicable

ADR

UN Number:	UN2920
UN Proper Shipping Name:	Corrosive Liquid, Flammable, N.O.S. (Contains Acetic Anhydride, Acetic Acid)
Transport Hazard Class(es):	8
Subsidiary Hazard:	(3)
Packing Group:	II
Environmental hazard:	Not applicable

IATA/ICAO

UN Number:	UN2920
UN Proper Shipping Name:	Corrosive Liquid, Flammable, N.O.S. (Contains Acetic Anhydride, Acetic Acid)
Transport Hazard Class(es):	8
Subsidiary Hazard:	(3)
Packing Group:	II
Environmental hazard:	Not applicable

14.1. UN Number: UN2920

14.2. UN Proper Shipping Name: Corrosive Liquid, Flammable, N.O.S. (Contains Acetic Anhydride, Acetic Acid)

14.3. Transport Hazard Class(es): 8 (3)

14.4. Packing Group: II

14.5. Environmental Hazards: Not applicable

14.6. Special Precautions for User: None

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

SECTION 15: Regulatory Information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories

EINECS Inventory	This product, and all its components, complies with EINECS
US TSCA Inventory	All components listed on inventory or are exempt.
Canadian DSL Inventory	All components listed on inventory or are exempt.

Legend
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

Germany, Water Endangering Classes (WGK) WGK 1: Low hazard to waters.

15.2. Chemical Safety Assessment
Yes

SECTION 16: Other Information

Full text of R-phrases referred to under Sections 2 and 3
R10 Flammable.
R20/22 Harmful by inhalation and if swallowed.
R34 Causes burns.
R35 Causes severe burns.

Key literature references and sources for data
www.ChemADVISOR.com/
NZ CCID

Revision Date: 22-Sep-2014
Revision Note
Update to Format SECTION: 8

This safety data sheet complies with the requirements of Regulation (EC) No. 453/2010

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End of Safety Data Sheet