



PAR TÉLÉCOPIE : 514 844-7009

Montréal, le 23 juillet 2012

M^e Michel Bélanger
Lauzon Bélanger Lespérance inc.
286, rue Saint-Paul Ouest
Bureau 100
Montréal (Québec) H2Y 2A3

V/Réf. :

N/Réf. : CM-2012-000396

Objet : Centre québécois du droit de l'environnement c. ministère du
Développement durable, de l'Environnement et des Parcs
Cause : 10 24 93

Cher confrère,

La présente donne suite à la lettre de M^e Marc-André Landry, représentant les intérêts de Talisman Energy inc. dans le dossier 10 24 93 devant la Commission d'accès à l'information datée du 25 mai 2012, dont vous avez reçu copie.

Étant donné que sa cliente ne s'objecte plus à la transmission des documents ci-dessous énumérés la concernant en lien avec le point 5 de votre demande d'accès, datée du 21 septembre 2010, nous vous informons que ces documents dont l'accès vous avait été refusé en vertu des articles 23 et 24 de la *Loi sur l'accès aux documents des organismes publics et sur la protection des renseignements personnels* (L.R.Q., c. A-2.1) sont maintenant accessibles, à savoir :

1. Composition du fluide de fracturation contenue dans l'Annexe 3 de la demande de certificat d'autorisation pour la fracturation hydraulique des puits qui seront forés sur le site Talisman Fortierville # 1 en vertu de l'article 22 de la Loi sur la qualité de l'environnement, 3 pages;
2. Composition du fluide de fracturation du site de La Visitation # 1 contenu dans la lettre du 24 novembre 2008, 4 pages;
3. Fiches signalétiques des additifs à fluide de fracturation, 47 pages;
4. Certificat d'analyses 09-291961, émis le 18 mars 2010, 9 pages;
5. Certificat d'analyses 10-335038, émis le 13 juillet 2010, 6 pages;
6. Certificat d'analyses 09-304013, émis le 4 août 2009, 9 pages;
7. Certificat d'analyses 10-321054, émis le 10 février 2010, 9 pages.

Cependant, nous devons vous informer que dans la préparation des copies à vous transmettre, nous avons constaté que pour deux documents visés par le point 5 de votre demande, M^e Landry n'a pas été consulté quant à leur accessibilité. Par conséquent, le ministère est en attente d'une réponse de M^e Landry afin de savoir si le consentement de sa cliente daté du 25 mai dernier de rendre accessible les documents s'applique également à ces deux autres documents.

Nous vous tiendrons informé dès que nous aurons obtenu des nouvelles de M^e Landry.

Veuillez noter que Me Bourgeault est en vacances jusqu'au 13 août prochain.

Espérant le tout conforme, veuillez agréer, cher confrère, l'expression de nos sentiments les meilleurs.

Bernard, Roy (Justice - Québec)



Manuel Klein, avocat
MK/lc

c. c. M^e Fabienne Coulombe, CAI
M^e Marc-André Landry, Blakes

CANADA

PROVINCE DE QUÉBEC

COMMISSION D'ACCÈS À
L'INFORMATION

N° : 10 24 93

CENTRE QUÉBÉCOIS DU DROIT DE
L'ENVIRONNEMENT

Demanderesse

c.

MINISTÈRE DU DÉVELOPPEMENT
DURABLE, DE L'ENVIRONNEMENT ET
DES PARCS

Organisme

**LISTE DES 7 DOCUMENTS JOINTS
À NOTRE LETTRE DU 12 JUILLET 2012
CONCERNANT LE POINT 5 DE LA DEMANDE D'ACCÈS
DU CENTRE QUÉBÉDOIS DU DROIT DE L'ENVIRONNEMENT**

DESCRIPTION	ONGLET
Composition du fluide de fracturation contenue dans..... 1 l'Annexe 3 de la demande de certificat d'autorisation pour la fracturation hydraulique des puits qui seront forés sur le site Talisman Fortierville # 1 en vertu de l'article 22 de la Loi sur la qualité de l'environnement, 3 pages	
Composition du fluide de fracturation du site de La Visitation # 1 2 contenu dans la lettre du 24 novembre 2008, 4 pages	
Fiches signalétiques des additifs à fluide de fracturation, 47 pages..... 3	
Certificat d'analyses 09-291961, émis le 18 mars 2010, 9 pages..... 4	

Certificat d'analyses 10-335038, émis le 13 juillet 2010, 6 pages	5
Certificat d'analyses 09-304013, émis le 4 août 2009, 9 pages.....	6
Certificat d'analyses 10-321054, émis le 10 février 2010, 9 pages.....	7

Montréal, le 23 juillet 2012

Bernard, Roy (Justice - Québec)
Procureurs de l'organisme

TALISMAN
E N E R G Y

TALISMAN ENERGY INC.
SUITE 2000, 888 3RD STREET S.W.
CALGARY ALBERTA T2P 5C5
FAX (403) 237-1902
TEL (403) 237-1234
www.talisman-energy.com

Titre du projet : Demande de certificat d'autorisation pour la fracturation hydraulique des puits qui seront forés sur le site Talisman Fortierville # 1 en vertu de l'article 22 de Loi sur la qualité de l'environnement

Annexe 3 : Description des travaux de fracturation des puits qui seront forés sur le site Talisman Fortierville # 1

Vers la mi-juin 2010, huit opérations de fracturation hydraulique seront réalisées successivement dans le premier puits foré sur le site Talisman Fortierville # 1. Chaque opération nécessitera l'injection dans le puits d'environ 1 800 m³ de fluide de fracturation.

Le fluide de fracturation sera essentiellement composé d'eau et de sable (99,4 % du volume). Les additifs chimiques composeront pour leur part moins de 0,1 % du volume total du fluide de fracturation. Les additifs chimiques susceptibles d'être utilisés sont les suivants :

- Breaker V
- FRW-16A friction reducer (inhibiteur de friction)
- FAC-3W (surfactant)

Mentionnons qu'un volume d'environ 8 mètres cubes de HCl 15 % sera injecté dans le puits avant chaque opération de fracturation hydraulique dans le but de dissoudre le carbonate de calcium de la formation géologique à fracturer. Le HCl 15 % renfermera :

- Ferrotol 800 (*iron control agent*)
- CI-27 Corrosion inhibitor
- D-3 Demulsifier
- FP-12 Foam preventer

Le HCl 15 % injecté avant chaque opération de fracturation représentera 0,5 % du volume total du fluide de fracturation (le HCl présent dans la formation géologique se mélangera avec le fluide de fracturation). Le HCl 15 % se retrouvera donc à l'état de trace dans le fluide de fracturation, probablement sous une autre forme (réaction avec le CaCO₃ de la formation géologique).

Les fiches signalétiques des produits listés ci-haut ont été jointes à la présente annexe. Mentionnons que les additifs seront entreposés sur le site de forage pendant une durée maximale de deux semaines dans les contenants de manutention du fournisseur.

Il est important de noter que la composition du fluide de fracturation et le nombre d'opérations de fracturation peuvent changer quelque peu en cours de processus.

L'eau nécessaire à la confection du fluide de fracturation proviendra de la rivière aux Ormes (voir annexe 2). L'eau pompée sera acheminée vers le site Talisman Fortierville # 1 à l'aide d'un pipeline déposé en bordure d'un chemin existant. L'eau sera par la suite entreposée sur le site dans deux bassins *C-Ring* de la compagnie *Westeel*. Ces bassins hors-terre ont un diamètre de 41,83 m, une hauteur de 3,35 m et une capacité de rétention de 4 500 m³ (figure 1). Il est muni d'une toile imperméable du manufacturier *LG Chem America*. Cette toile a une épaisseur de 0,86 mm. La figure 2 présente un schéma du site avec les équipements.

À la suite des opérations de fracturation hydraulique, ce sont au total entre 4 000 et 7 500 m³ de fluide de fracturation qui remonteront à la surface du puits sur une période d'un mois, soit entre 25 à 50 % du volume total de fluide injecté (15 000 m³). Le fluide de fracturation remontant vers la surface («flow-back») sera entreposé dans réservoirs hors terre en attendant d'être acheminé vers la station d'épuration des eaux usées de la Ville de Drummondville pour y être traité (si respect des normes de rejet dans les égouts de la Ville). L'entente de service de la Ville de Drummondville a été jointe à la présente annexe. Si les résultats ne permettent pas d'acheminer les eaux usées à la station d'épuration de Drummondville, elles seront prises en charge par Veolia ou Newalta. Il se pourrait également que les eaux usées soient réutilisées lors d'autres travaux de fracturation hydraulique (sur un autre site).

Puisqu'aucun pré-traitement ne sera réalisé sur le site Talisman Fortierville # 1, Talisman ne sollicite pas d'autorisation en vertu de l'article 32 de la Loi sur la qualité de l'environnement. À titre d'information complémentaire, un certificat d'analyse précisant les propriétés physico-chimiques du fluide de fracturation remontant à la surface du puits Talisman Gentilly # 1 («flow-back») a également été joint à la présente annexe.

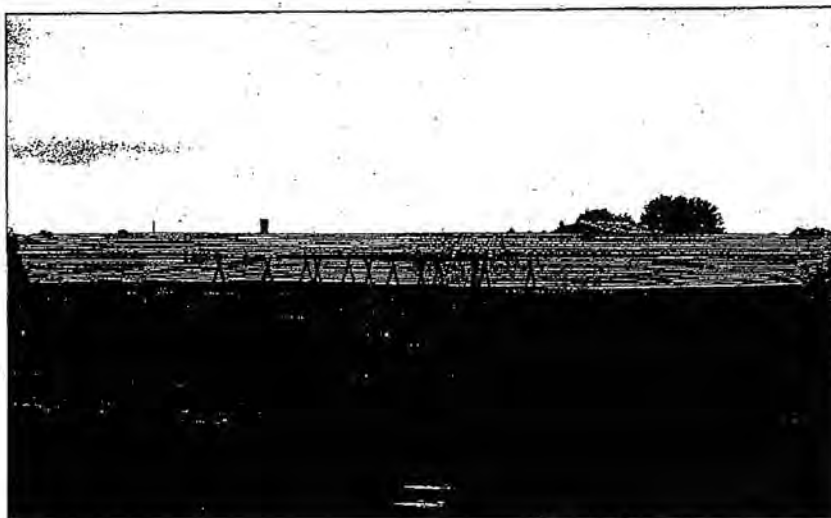


Figure 1. Bassin C-Ring.

Voici le calendrier provisoire de réalisation des travaux de fracturation hydraulique dans le premier puits foré sur le site Talisman Fortierville # 1

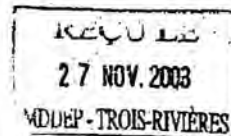
- Mise en place des équipements de fracturation : 10 juin 2010
- Opérations de fracturation : 15 juin 2010
- Disposition des fluides : à la fin des opérations, soit probablement en juillet 2010
- Démantèlement des équipements de fracturation : juillet 2010*
- Remise en état du site : la CPTAQ nous donne jusqu'en 2019 pour remettre en état le site de forage (voir extrait du rapport d'expertise agroforestière complémentaire à la demande à la CPTAQ précisant les mesures de remise en état. L'extrait de ce rapport a été joint à la présente annexe.)

On peut également s'attendre à un calendrier similaire pour les travaux de fracturation qui seront réalisés dans les autres puits prévus sur le site Talisman Fortierville # 1.

TALISMAN
ENERGY

TALISMAN ENERGY INC.
SUITE 2000, 888 3RD STREET S.W.
CALGARY ALBERTA T2P 5C5
FAX (403) 237-1902
TEL (403) 237-1234
www.talisman-energy.com

Québec, le 24 novembre 2008



Ministère du Développement durable
de l'Environnement et des Parcs
Dir. régionale de l'analyse et de l'expertise
de la Mauricie et du Centre-du-Québec
100, rue Laviolette, bureau 102
Trois-Rivières (Que) G9A 5S9
À l'attention de M. Alain Mallette

Objet : **Talisman Energy Inc.**
No Référence : 7610-17-01-03180-01
400 539 863

Monsieur Mallette,

Par la présente, je vous transmets les précisions concernant la demande d'autorisation pour l'utilisation d'une toçhère sur les site de forage La Visitation # 1 de la compagnie Talisman Energy Inc. Les informations contenues dans ce document m'ont été transmises par M. Ronald Stinson, le signataire de la demande.

En espérant répondre à vos interrogations concernant cette demande, veuillez recevoir, Monsieur Mallette, mes plus cordiales salutations.

A handwritten signature in dark ink, appearing to read "Vincent Perron".

Vincent Perron, M.Sc. Env.
Prospecto Inc.
Consultant pour Talisman Energy Inc
111, rue Jean-Juneau #207
Saint-Augustin-de-Desmaures (Qc)
G3A 0B2
418-809-8029
vincent.perron@videotron.ca

Question # 1 : Localisation et description du bassin d'accumulation des eaux

Les eaux qui seront prélevées dans la rivière Nicolet Sud-Ouest pour la confection du fluide de fracturation seront entreposées dans un bassin *C-Ring* de la compagnie Weststeel. Ce bassin a un diamètre de 41,83 m, une hauteur de 2,26 m et une capacité de rétention de 3 000 m³ (figure 1). Il est muni d'une toile imperméable du manufacturier LG Chem America. Cette toile a une épaisseur de 0,86 mm. Le bassin *C-Ring* est situé dans le coin nord-ouest du site de forage du puits *La Visitation # 1* (figure 2).

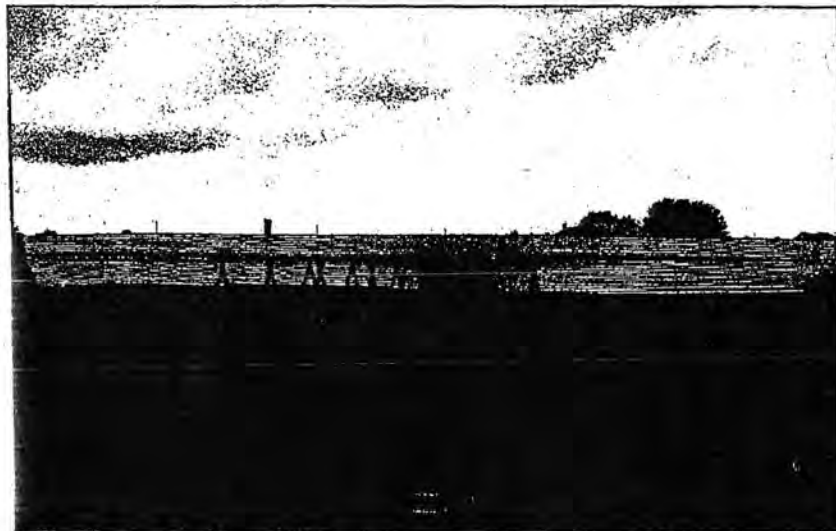


Figure 1. Bassin *C-Ring* localisé sur le site de forage du puits *La Visitation # 1*.

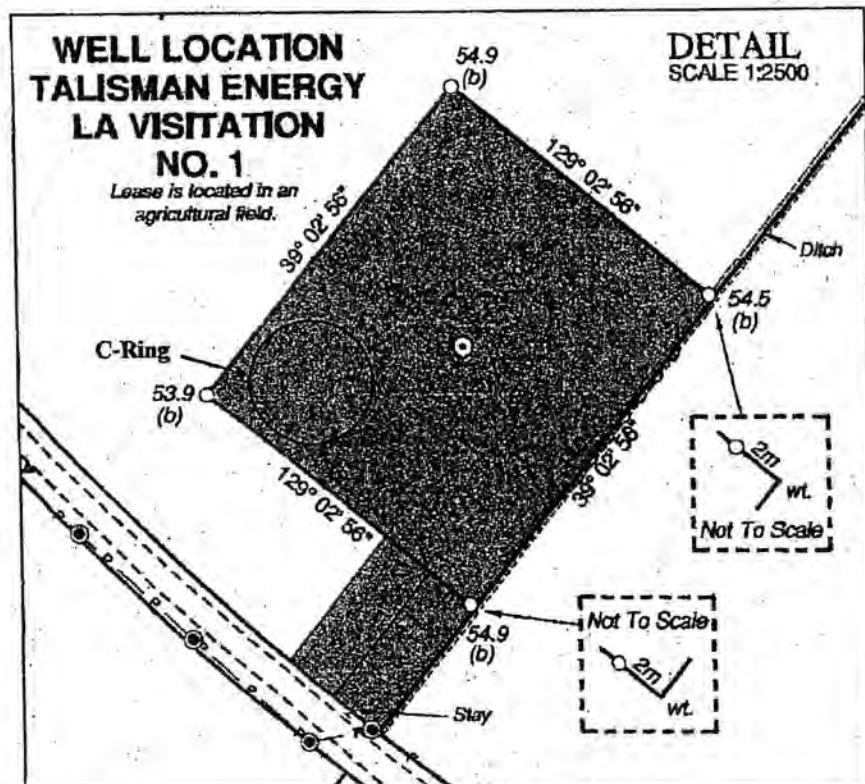


Figure 2. Localisation du bassin C-Ring sur le site de forage du puits *La Visitation* # 1.

Question # 2 : Calendrier de réalisation des travaux

- Mise en place des équipements : 30 novembre 2008
- Fracturation : 1^{er} décembre 2008*
- Disposition des fluides : à la fin des opérations, soit probablement en mars 2009*
- Démantèlement des équipements : mars 2009*
- Remise en état du site : la CPTAQ nous donne jusqu'au 19 août 2011 pour remettre en état le site de forage.

* Trois à quatre fracturations sont prévues successivement à différentes profondeurs dans le puits *La Visitation* # 1. Ces travaux devraient se terminer vers le début du mois de mars 2009.

Question # 3 : Entente avec la Ville de Drummondville

Talisman Energy Inc. a signé une entente de service avec la Ville de Drummondville le 5 novembre 2008 (rejet des eaux usées). Cette entente a été jointe au présent document.

Question # 4 : Composition complète du fluide de fracturation

Tel que précisé, à l'annexe 3 associée au formulaire général, le fluide de fracturation sera essentiellement composé d'eau (95 %) et d'additifs (5 %), c'est-à-dire un surfactant (FAC-3W), des «breakers» (Breaker AB et Breaker V) et du sable. Ces additifs seront ajoutés dans le bassin C-Ring avant chaque opération de fracturation. Les fiches signalétiques de ces additifs vous ont déjà été transmises.

Mentionnons que le retour du fluide de fracturation vers la surface du puits (flow-back) sera entreposé dans le C-Ring. Pour chaque opération de fracturation dans le puits *La Visitation # 1*, ce sont environ 1 000 m³ de fluide qui remonteront vers la surface, soit 50 % du volume total de fluide injecté initialement.

Après chaque opération de fracturation dans le puits *La Visitation # 1*, le fluide remontant à la surface sera entreposé dans le C-Ring afin d'être réutilisé pour l'opération de fracturation subséquente. Un total de 1 000 m³ d'eau douce devra toutefois être ajouté dans le C-Ring afin de compléter le volume requis de fluide de fracturation (2 000 m³). Les additifs mentionnés précédemment devront également être ajoutés afin qu'ils représentent 5 % du volume total du fluide de fracturation.

Ainsi, à la suite des opérations de fracturation dans le puits *La Visitation # 1*, ce sont environ 1 000 m³ de fluide (dernier retour de fluide vers la surface) qui devront être disposés dans la station d'épuration des eaux usées de la Ville de Drummondville.



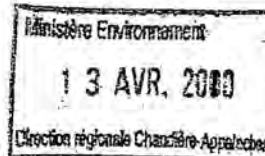
BJ SERVICES COMPANY CANADA MATERIAL SAFETY DATA SHEET

Region
Canada

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Ferrotrol 800**
Product Use: Iron sequestrant
Chemical Family: Organic salt

Supplier:
BJ Services Company Canada
1300, 801 - 6th Avenue SW
Calgary, Alberta, Canada T2P 4E1
Phone: (403) 531-5151



IN CASE OF EMERGENCY CALL: (403) 531-5151 (24 hrs)

2 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	Concentration	ACGIH TLV	ACGIH STEL
Trisodium nitrilotriacetate monohydrate 018682-63-8	95-100	NA	NA

3 HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: Inhalation, Ingestion, Eye contact.

ACUTE OVEREXPOSURE EFFECTS:

INHALATION: Inhalation of dust may cause respiratory tract irritation.

INGESTION: May cause nausea, vomiting and diarrhea.

EYE CONTACT: May cause moderate eye irritation.

SKIN CONTACT: Prolonged contact may cause mild irritation.

4 FIRST AID MEASURES

INHALATION:

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

INGESTION:

Rinse mouth with water several times. Do not induce vomiting. Give victim plenty of water. Obtain medical attention immediately.

EYES:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

SKIN:

Gently brush away excess material. Flush skin with plenty of water. Remove contaminated clothing and launder before reuse. Obtain medical attention if irritation develops or persists following exposure.

5 FIRE FIGHTING MEASURES

FLASHPOINT (METHOD): None
LOWER EXPLOSION LIMIT (% v/v): Not applicable
UPPER EXPLOSION LIMIT (% v/v): Not applicable
AUTO-IGNITION TEMPERATURE: Not applicable

SPECIAL HAZARDS:

May form explosive dust-air mixture.

EXTINGUISHING MEDIA:

Use appropriate media for surrounding fire.

SPECIAL FIREFIGHTING PROCEDURES:

Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires.

HAZARDOUS COMBUSTION PRODUCTS:

Oxides of carbon and nitrogen.

SENSITIVITY TO STATIC DISCHARGE: Yes (dust)

SENSITIVITY TO MECHANICAL IMPACT: No

6 ACCIDENTAL RELEASE MEASURES

Wear specified protective equipment. Prevent from entering sewers or waterways. Sweep, scoop, or vacuum up spill, while taking care not to disperse dust in the air. Place in suitable container(s) for reuse or disposal. Flush remaining traces of material with copious quantities of water.

7 HANDLING AND STORAGE

HANDLING:

Wear specified protective equipment.

STORAGE REQUIREMENTS:

Keep in a cool, well ventilated place. Keep container dry. Keep away from incompatible materials.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

SPECIFIC ENGINEERING CONTROLS:

Use only in a well ventilated area.

PERSONAL PROTECTIVE EQUIPMENT:

Dust mask. Chemical resistant goggles. Rubber gloves. Coveralls. Rubber boots.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Solid
COLOR:	White
ODOR:	None
ODOR THRESHOLD:	Not applicable
SPECIFIC GRAVITY:	1.8
VAPOR PRESSURE:	Not applicable
VAPOR DENSITY (air = 1):	Not applicable
EVAPORATION RATE:	Not applicable
BOILING POINT:	Not applicable
FREEZING POINT:	Not applicable
pH:	11 (1% sol.)
VISCOSITY (c):	Not applicable
SOLUBILITY IN WATER:	50% @ 20°C
COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not available

10 STABILITY AND REACTIVITY

STABILITY:

Stable.

INCOMPATIBILITY/CONDITIONS OF REACTIVITY:

Strong oxidizers.
HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:
Oxides of carbon and nitrogen.
HAZARDOUS POLYMERIZATION:
Will not occur.

11 TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS:
None known.

SENSITIZATION:
Not known.

CARCINOGENICITY:
Nitroacetate acid and its salts are listed as Group 2B (possibly carcinogenic to humans) carcinogens by the International Agency for Research on Cancer (IARC).

MUTAGENICITY:
Not known.

REPRODUCTIVE TOXICITY:
Not known.

12 ECOLOGICAL INFORMATION

No specific information available.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:
Disposal should be made in accordance with national and local regulations. Consult local waste authorities for direction and/or approvals prior to disposal.

14 TRANSPORT INFORMATION

TDG
Proper Shipping Name: NOT RESTRICTED
UN No.: NA
Hazard Class - Primary:
Hazard Class - Secondary:
Packing Group:

AIR TRANSPORT (ICAO/IATA)
Proper Shipping Name: NOT RESTRICTED
UN No.: NA
Hazard Class - Primary:
Hazard Class - Secondary:
Packing Group:

MARINE TRANSPORT (IMDG/IMO)
Proper Shipping Name: NOT RESTRICTED
UN No.: NA
Hazard Class - Primary:
Hazard Class - Secondary:
Packing Group:
EmS:

15 REGULATORY INFORMATION



D-2A (See Section 11)
D-2B (Eye/skin irritant)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

16 OTHER INFORMATION

ISSUE DATE: 04/09/2007
REVISIONS: General Review
PREPARED BY: Chemical Technology Centre

REFERENCES:

Supplier's Literature.

CCINFO Web Information Service, Canadian Centre for Occupational Health and Safety, 2007.
International Marine Dangerous Goods Code, 2002 Edition, International Maritime Organisation, 2002.
Dangerous Goods Regulations, 48th ed., International Air Transport Association, 2007.
TDG Clear Language Regulations, as published in the Canada Gazette Part II, August 2001.

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

Revision:	Sec/Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	01/09/95
2	V	Incompatibility and general review/reformat	01/10/98
3	NA	Product name change (formerly Noweco IS-500)	28/08/00
4	II and V	Corrected CAS no. and incompatible materials; WHMIS three year review.	01/10/01
5	N/A	Reformat	29/09/04
6	N/A	General Review	04/09/07

From: Wylie Dallen [wdallen@bjservices.ca]
Sent: Tuesday, August 11, 2009 11:46 AM
To: Knight, Tim

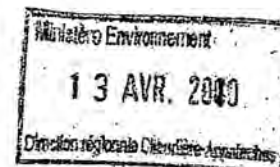
----- Forwarded by Wylie Dallen/BJSCAN/BJSERVICES on 11/08/2009 11:45 AM -----

☒	BJ SERVICES COMPANY CANADA MATERIAL SAFETY DATA SHEET	Région Canada
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1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: **CI-27**
 Product Use: Corrosion Inhibitor
 Chemical Family: Mixture

Supplier:
 B.J. Services Company Canada
 1300, 801 - 6th Avenue SW
 Calgary, Alberta, Canada T2P 4E1
 Phone: (403) 531-5151



IN CASE OF EMERGENCY CALL: (403) 531-5151 (24 hrs)

2 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient CAS#	%	ACGIH TWA	ACGIH STEL
Methanol 000087-56-1	30-60	200 ppm, skin	250 ppm, skin
Thiourea polymer 068527-49-1	10-30	NA	NA
Tall oil acid 061790-12-3	10-30	NA	NA
Ethoxylated alcohols, C14-15 068951-67-7	10-30	NA	NA
Propargyl alcohol 000107-19-7	5-10	1 ppm, skin	NA
Alkenes, C>10 alpha- 064743-02-8	1-5	NA	NA

3 HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: Inhalation, Ingestion, Eye contact, Skin contact, Skin absorption.

ACUTE OVEREXPOSURE EFFECTS:

INHALATION: Inhalation of solution vapor or mist may cause respiratory tract irritation. May cause headache, dizziness, nausea and incoordination. May cause visual disturbances.

INGESTION: Ingestion may cause severe irritation or burns to the mouth, throat and esophagus. May cause nausea, dizziness or loss of coordination. May cause visual impairments, ocular damage and possibly blindness if not treated medically.

EYE CONTACT: May cause severe eye irritation. May cause burns with prolonged contact.

SKIN CONTACT: May cause skin irritation or burns with prolonged contact. May be absorbed through the skin and contribute to the symptoms listed under Ingestion.

ACUTE TOXICITY:

Ingredient CAS#	%	LC50 (inhalation)	LD50 (oral)
Methanol 000067-56-1	30-60	64000 ppm/4 rat	5600 mg/kg rat
Propargyl alcohol 000107-19-7	5-10	873 ppm/2 rat	20 mg/kg rat

4 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. Only trained personnel should administer oxygen. Get medical attention.

INGESTION:

Rinse mouth with water several times. DO NOT induce vomiting. If vomiting occurs naturally, keep head lower than hips to prevent aspiration. Obtain medical assistance immediately.

EYES:

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

SKIN:

In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and laundry before reuse. Get medical attention if irritation persists.

5 FIRE FIGHTING MEASURES

FLASHPOINT (METHOD): 10°C (TCC)

LOWER EXPLOSION LIMIT (% v/v): Not available

UPPER EXPLOSION LIMIT (% v/v): Not available

AUTO-IGNITION TEMPERATURE: Not available

SPECIAL HAZARDS:

May form flammable vapour-air mixture. This product or a component thereof can flow along surfaces to reach a distant ignition source and flash back.

EXTINGUISHING MEDIA:

Water fog, carbon dioxide, foam, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES:

Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires. Cool exposed containers with water spray.

HAZARDOUS COMBUSTION PRODUCTS:

Oxides of carbon, nitrogen and sulphur.

SENSITIVITY TO STATIC DISCHARGE: Yes (vapor)

SENSITIVITY TO MECHANICAL IMPACT: No

6 ACCIDENTAL RELEASE MEASURES

Wear specified protective equipment. Remove sources of ignition. Small spills - Cover spill with absorbent material. Scoop absorbed material into a suitable container for disposal. Large spills - Dike to contain. Prevent from entering sewers or waterways. Recover product to suitable containers or vessel for reuse, if possible, or for disposal. Use only explosion proof transfer equipment.

7 HANDLING AND STORAGE

HANDLING:

Wear specified protective equipment. Use only in a well ventilated area. Use only spark-proof and explosion-proof tools and equipment.

STORAGE REQUIREMENTS:

Keep in a cool, well ventilated place. Keep away from ignition sources. Keep away from heat. Keep away from incompatible materials. Emptied containers may retain hazardous properties.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

SPECIFIC ENGINEERING CONTROLS:

Use only in a well ventilated area. Local exhaust. Adequate ventilation should be provided to keep concentrations below acceptable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Appropriate respiratory protection shall be worn when applied engineering controls are not adequate to protect against inhalation exposure (Cartridge respirator). Chemical resistant goggles. Butyl rubber gloves. Coveralls. Rubber apron. Rubber boots.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Liquid

COLOR: Amber

ODOR: Sweet

ODOR THRESHOLD: Not available

SPECIFIC GRAVITY: 0.9 @ 16°C

VAPOR PRESSURE: 85 mmHg @ 21°C (calculated)

VAPOR DENSITY (air = 1): > 1

EVAPORATION RATE: Not available

BOILING POINT: Not available

FREEZING POINT: < -29°C

pH: 4-6 (5% sol.)

VISCOSITY (C): Not available

SOLUBILITY IN WATER: Dispersible

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

10 STABILITY AND REACTIVITY

STABILITY:

Stable under normal conditions of use.

INCOMPATIBILITY/CONDITIONS OF REACTIVITY:

Strong oxidizers.

HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:

Oxides of carbon, nitrogen and sulphur.

HAZARDOUS POLYMERIZATION:

Will not occur.

11 TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS:

May cause central nervous system depression. Optic nerve damage. Liver and kidney damage. Dermatitis.

SENSITIZATION:

Not known.

CARCINOGENICITY:

None of the components of this product have been listed as carcinogenic by IARC, NTP or OSHA. (IARC - International Agency for Research on Cancer) (NTP - National Toxicology Program) (OSHA - Occupational Safety & Health Administration (US))

MUTAGENICITY:

Not known.

REPRODUCTIVE TOXICITY:

This product contains methanol (30-60%) which has been reported to cause fetotoxicity and teratogenicity in rats and mice when they were exposed by inhalation to high concentrations that did not produce significant maternal toxicity.

12 ECOLOGICAL INFORMATION

No specific information available.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:

Disposal should be made in accordance with national and local regulations. Consult local waste authorities for direction and/or approvals prior to disposal.

14 TRANSPORT INFORMATION

TDG

Proper Shipping Name: FLAMMABLE LIQUID, TOXIC, N.O.S.

Technical Name(s): Methanol, Propargyl alcohol

UN No.: UN 1992

Hazard Class - Primary: 3

Hazard Class - Secondary: 6.1

Packing Group: II

AIR TRANSPORT (ICAO/IATA)

Proper Shipping Name: FLAMMABLE LIQUID, TOXIC, N.O.S.

Technical Name(s): Methanol, Propargyl alcohol

UN No.: UN 1992

Hazard Class - Primary: 3

Hazard Class - Secondary: 6.1

Packing Group: II

MARINE TRANSPORT (IMDG/IMO)

Proper Shipping Name: FLAMMABLE LIQUID, TOXIC, N.O.S.

Technical Name(s): Methanol, Propargyl alcohol

UN No.: UN 1992

Hazard Class - Primary: 3

Hazard Class - Secondary: 6.1

Packing Group: II
EmS: F-E, S-D

15 REGULATORY INFORMATION

WHMIS:

B-2 (Flammable liquid),
D-1A (Acute toxicity)
D-2A (See Section 11)
D-2B (Eye/skin irritant)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by these regulations.

16 OTHER INFORMATION

ISSUE DATE: 09/04/2008

REVISIONS: Sections

PREPARED BY: Chemical Technology Centre

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

Revision: 4 Status: Approved & Released MSDS

Revision History:

Revision:	Sec/ Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	29/02/00
2	All	Converted to 16-Section format.	12/02/03
3	2, 3, 5, 9 and 11	Review/Reformat. Remove HMIRG exemption. Disclose all ingredient info in table. Update LD50 value for methanol. Update flashpoint. Change odor to sweet. Adjust freeze point value and temp for sp gr. Update vapour pressure value. Add more risk phrases to Chronic Effects.	22/03/06
4	3, 5, 9 and 10	Revised hazards, flash point, pH and incompatible materials.	09/04/09

First Approver	
Name: Doug Smith	Approved - 13/04/2009 by Doug Smith
Title: Field Safety Manager	
Second Approver	
Name: "	
Title:	
History	
New MSDS created 10/04/2009 09:07 PM by Nancy Greenwood	
First Approver Selected 10/04/2009 09:13 PM by Nancy Greenwood	
MSDS submitted for Final Approval by Nancy Greenwood ~ 10/04/2009	
Final Approval 13/04/2009 08:12 AM by Doug Smith	

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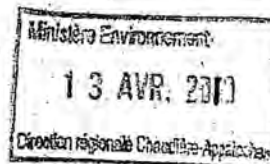
BJ SERVICES COMPANY CANADA MATERIAL SAFETY DATA SHEET

Region
Canada

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: **D-3**
Product Use: Non-emulsifier
Chemical Family: Mixture

Supplier:
BJ Services Company Canada
1300, 801 - 6th Avenue SW
Calgary, Alberta, Canada T2P 4E1
Phone: (403) 531-5151



IN CASE OF EMERGENCY CALL: (403) 531-5151 (24 hrs)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient CAS		ACUTE TOXICITY	ACUTE TOXICITY
Methanol 000067-58-1	1-5	200 ppm, skin	250 ppm, skin
Isopropanol 000067-63-0	60-100	200 ppm	400 ppm
Ethoxylated alcohol, branched 078330-19-5	1-5	NA	NA

3. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: Inhalation. Ingestion. Eye contact. Skin contact.

ACUTE OVEREXPOSURE EFFECTS:

INHALATION: Inhalation of solution vapor or mist may cause respiratory tract irritation. May cause headache, dizziness, nausea and incoordination.

INGESTION: May cause headache, dizziness, nausea, vomiting, gastrointestinal irritation and central nervous system depression. Minute amounts aspirated into the lungs during ingestion or vomiting may cause severe pulmonary injury.

EYE CONTACT: Vapors are irritating to eyes. May cause severe eye irritation. May cause corneal injury.

SKIN CONTACT: May cause mild skin irritation.

ACUTE TOXICITY:

Ingredient CAS		LC50 Inhalation	LD50 (oral)
Methanol 000067-58-1	1-5	84000 ppm/4 rat	5600 mg/kg rat
Isopropanol 000067-63-0	60-100	18000 ppm/8 rat	5046 mg/kg rat

4 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. Only trained personnel should administer oxygen. Get medical attention.

INGESTION:

Rinse mouth with water several times. DO NOT induce vomiting. Give victim plenty of water. Obtain medical assistance immediately. If vomiting occurs naturally, keep head lower than hips to prevent aspiration.

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.

SKIN:

Wash with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if irritation persists.

5 FIRE FIGHTING MEASURES

FLASHPOINT (METHOD):

12°C (TCC)

LOWER EXPLOSION LIMIT (% v/v):

2.0 (Isopropanol)

UPPER EXPLOSION LIMIT (% v/v):

12.0 (Isopropanol)

AUTO-IGNITION TEMPERATURE:

399°C (Isopropanol)

SPECIAL HAZARDS:

Vapors may form explosive mixture with air. This product or a component thereof can flow along surfaces to reach a distant ignition source and flash back. Vapor may be ignited by static discharge.

EXTINGUISHING MEDIA:

Water fog, carbon dioxide, foam, dry chemical.

SPECIAL FIREFIGHTING PROCEDURES:

Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires.

Cool exposed containers with water spray.

HAZARDOUS COMBUSTION PRODUCTS:

Oxides of carbon.

SENSITIVITY TO STATIC DISCHARGE: Yes (vapor)

SENSITIVITY TO MECHANICAL IMPACT: Not Available

6 ACCIDENTAL RELEASE MEASURES

Wear specified protective equipment. Remove sources of ignition. Small spills - Cover spill with absorbent material. Scoop absorbed material into a suitable container for disposal. Large spills - Dike to contain. Prevent from entering sewers or waterways. Recover product to suitable containers or vessel for reuse, if possible, or for disposal. Use only explosion proof transfer equipment.

7. HANDLING AND STORAGE

HANDLING:

Use only in a well ventilated area. Use only spark-proof and explosion-proof tools and equipment. Wear specified protective equipment.

STORAGE REQUIREMENTS:

Keep in a cool, well ventilated place. Keep away from ignition sources. Keep away from heat. Keep away from incompatible materials. Keep container closed when not in use.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

SPECIFIC ENGINEERING CONTROLS:

Local exhaust.

PERSONAL PROTECTIVE EQUIPMENT:

Appropriate respiratory protection shall be worn when applied engineering controls are not adequate to protect against inhalation exposure. Cartridge respirator. Chemical resistant goggles. Rubber gloves. Rubber apron. Rubber boots. Coveralls.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
COLOR:	Clear/colorless
ODOR:	Alcohol-
ODOR THRESHOLD:	Not available
SPECIFIC GRAVITY:	0.79 @ 25°C
VAPOR PRESSURE:	4.4 kPa @20°C (isopropanol)
VAPOR DENSITY (air = 1):	2.07 (isopropanol)
EVAPORATION RATE:	1.5 (n-butyl acetate=1) (isopropanol)
BOILING POINT:	82°C (isopropanol)
FREEZING POINT:	< -70°C
pH:	4.78 (5% sol.)
VISCOSITY (c):	Not available
SOLUBILITY IN WATER:	Complete
COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not available

10 STABILITY AND REACTIVITY

STABILITY:

Stable under normal conditions of use.

INCOMPATIBILITY/CONDITIONS OF REACTIVITY:

May react violently with strong oxidizers or acids (nitric, sulphuric). Contact with alkali and alkaline earth metals may produce flammable hydrogen gas. Reacts vigorously with aluminum.

HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:

Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION:

Will not occur.

11 TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS:

Prolonged or repeated over exposure may cause central nervous system depression. Dermal:.

SENSITIZATION:

Not known.

CARCINOGENICITY:

None of the components of this product have been listed as carcinogenic by IARC, NTP or OSHA. (IARC- International Agency for Research on Cancer) (NTP - National Toxicology Program) (OSHA - Occupational Safety & Health Administration (US))

MUTAGENICITY:

Not known.

REPRODUCTIVE TOXICITY:

This product contains methanol (1-5%) which has been reported to cause fetotoxicity and teratogenicity in rats and mice when they were exposed by inhalation to high concentrations that did not produce significant maternal toxicity.

12 ECOLOGICAL INFORMATION

No specific information available.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:

Disposal should be made in accordance with national and local regulations. Consult local waste authorities for direction and/or approvals prior to disposal.

14 TRANSPORT INFORMATION

TDG

Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.
Technical Name(s): Isopropanol, Methanol
UN No.: UN 1993
Hazard Class - Primary: 3
Hazard Class - Secondary:
Packing Group: II

AIR TRANSPORT (ICAO/IATA)

Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.
Technical Name(s): Isopropanol, Methanol
UN No.: UN 1993
Hazard Class - Primary: 3
Hazard Class - Secondary:
Packing Group: II

MARINE TRANSPORT (IMDG/IMO)

Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.
Technical Name(s): Isopropanol, Methanol
UN No.: UN 1993
Hazard Class - Primary: 3
Hazard Class - Secondary:
Packing Group: II
EmS: F-E, S-E

15 REGULATORY INFORMATION**WHMIS:**

B-2 (Flammable liquid)
D-2A (See Section 11)
D-2B (See Sections 9 and 11)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

16 OTHER INFORMATION

ISSUE DATE: 12/12/2007
REVISIONS: Sections 8 and 9
PREPARED BY: Chemical Technology Centre
REFERENCES:

Supplier's Literature.
CCINFO Web Information Service, Canadian Centre for Occupational Health and Safety, 2007.
International Marine Dangerous Goods Code, 2002 Edition, International Maritime Organisation, 2002.
Dangerous Goods Regulations, 48th ed., International Air Transport Association, 2007.
TDG Clear Language Regulations, as published in the Canada Gazette Part II, August 2001.
Guide to Occupational Exposure Values - 2007, American Conference of Governmental Industrial Hygienists, 2007.

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Revision:	Sec/Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	21/01/00
2	Sections VI and IX	Toxicogenicity (methanol); WHMIS D-2A.	19/12/01
3	2 and 3	Reformat/Review. Update hazardous ingredients in product. Update TWA and STEL values for Isopropanol. Update LD50 value for methanol.	11/02/05
4	9	Change specific gravity.	14/12/05
5	8 and 9	General review. Update PPE and physical properties.	12/12/07



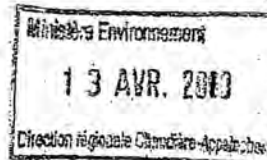
BJ SERVICES COMPANY CANADA MATERIAL SAFETY DATA SHEET

Page 1
Canada

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: **FP-12L**
Product Use: Anti-foamer
Chemical Family: Silicon emulsion

Supplier:
BJ Services Company Canada
1300, 801 - 6th Avenue SW
Calgary, Alberta, Canada T2P 4E1
Phone: (403) 531-5151



IN CASE OF EMERGENCY CALL: (403) 531-5151 (24 hrs)

2 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient: **FP-12L**
Non-hazardous: **100%**

3 HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: Eye contact.

ACUTE OVEREXPOSURE EFFECTS:

INHALATION: Not a likely exposure route.

INGESTION: Not a likely exposure route. Ingestion of large quantities may cause abdominal discomfort.

EYE CONTACT: Direct contact with solution may cause mild transient eye irritation.

SKIN CONTACT: None known.

4 FIRST AID MEASURES

INHALATION:

None required.

INGESTION:

Rinse mouth out with water. Drink plenty of water. If significant quantities were ingested, seek medical advice.

EYES:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

SKIN:

Wash with soap and water. Remove contaminated clothing and laundry before reuse. Get medical attention if irritation persists.

5 FIRE FIGHTING MEASURES

FLASHPOINT (METHOD):	> 100°C (CC)
LOWER EXPLOSION LIMIT (% v/v):	Not available
UPPER EXPLOSION LIMIT (% v/v):	Not available
AUTO-IGNITION TEMPERATURE:	Not available

SPECIAL HAZARDS:

Product may burn in fire situation after water has evaporated from the mixture.

EXTINGUISHING MEDIA:

Water fog, carbon dioxide, foam, dry chemical.

SPECIAL FIREFIGHTING PROCEDURES:

Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires. Cool exposed containers with water spray.

HAZARDOUS COMBUSTION PRODUCTS:

See Hazardous Thermal Decomposition Products.

SENSITIVITY TO STATIC DISCHARGE: No

SENSITIVITY TO MECHANICAL IMPACT: No

6 ACCIDENTAL RELEASE MEASURES

Wear specified protective equipment. Small spills - Cover spill with absorbent material. Scoop absorbed material into a suitable container for disposal. Large spills - Dike to contain. Prevent from entering sewers or waterways. Recover product to suitable containers or vessel for reuse, if possible, or for disposal.

7 HANDLING AND STORAGE**HANDLING:**

Wear specified protective equipment.

STORAGE REQUIREMENTS:

Keep away from incompatible materials. Protect from freezing.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION**SPECIFIC ENGINEERING CONTROLS:**

Use only in a well ventilated area.

PERSONAL PROTECTIVE EQUIPMENT:

Chemical resistant goggles, Rubber gloves, Coveralls.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
COLOR:	White
ODOR:	Mild
ODOR THRESHOLD:	Not available
SPECIFIC GRAVITY:	1.0 @ 25°C
VAPOR PRESSURE:	Not available
VAPOR DENSITY (air = 1):	Not available
EVAPORATION RATE:	Not available
BOILING POINT:	Not available
FREEZING POINT:	Not available
pH:	Not available
VISCOSITY (C):	Not available
SOLUBILITY IN WATER:	Miscible
COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not available

10 STABILITY AND REACTIVITY**STABILITY:**

Stable.

INCOMPATIBILITY/CONDITIONS OF REACTIVITY:

Strong oxidizers.

HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:
Silicon dioxide, Carbon monoxide, Carbon dioxide, Formaldehyde.

HAZARDOUS POLYMERIZATION:
Will not occur.

11 TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS:
None known.

SENSITIZATION:
Not known.

CARCINOGENICITY:
None of the components of this product have been listed as carcinogenic by IARC, NTP or OSHA. (IARC - International Agency for Research on Cancer) (NTP - National Toxicology Program) (OSHA - Occupational Safety & Health Administration (US))

MUTAGENICITY:
Not known.

REPRODUCTIVE TOXICITY:
Not known.

12 ECOLOGICAL INFORMATION

No specific information available.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:
Disposal should be made in accordance with national and local regulations. Consult local waste authorities for direction and/or approvals prior to disposal.

14 TRANSPORT INFORMATION

TDG

Proper Shipping Name: NOT RESTRICTED
UN No.: NA
Hazard Class - Primary:
Hazard Class - Secondary:
Packing Group:

AIR TRANSPORT (ICAO/IATA)

Proper Shipping Name: NOT RESTRICTED
UN No.: NA
Hazard Class - Primary:
Hazard Class - Secondary:
Packing Group:

MARINE TRANSPORT (IMDG/IMO)

Proper Shipping Name: NOT RESTRICTED
UN No.: NA
Hazard Class - Primary:

Hazard Class - Secondary:
Packing Group:
EmS:

15 REGULATORY INFORMATION

WHMIS:
Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

16 OTHER INFORMATION

ISSUE DATE: 22/11/2006
REVISIONS: Reformat / Review
PREPARED BY: Chemical Technology Centre

REFERENCES:
Supplier's Literature.
CCINFO Web Information Service, Canadian Centre for Occupational Health and Safety, 2008.
International Marine Dangerous Goods Code, 2002 Edition, International Maritime Organisation, 2002.
Dangerous Goods Regulations, 47th ed., International Air Transport Association, 2006.
TDG Clear Language Regulations, as published in the Canada Gazette Part II, August 2001.

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

Revision:	Sec/Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	01/02/95
2	III and VI	Physical properties, flammability data.	12/01/98
3	N/A	Product name change, formerly Nowesco AFA-2 or Fracmaster Delpamer-1.	14/03/00
4	N/A	Product name change, formerly Nowesco-Fracmaster FP-20L; WHMIS 3 year review.	10/10/00
5	N/A	General review.	07/11/03
6	N/A	Reformat/Review	22/11/06



BJ SERVICES COMPANY CANADA MATERIAL SAFETY DATA SHEET

Région
Canada

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Ferrotrol 800**
Product Use: Iron sequestrant
Chemical Family: Organic salt

Supplier:
BJ Services Company Canada
1300, 801 - 6th Avenue SW
Calgary, Alberta, Canada T2P 4E1
Phone: (403) 531-5151

IN CASE OF EMERGENCY CALL: (403) 531-5151 (24 hrs)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS#	Conc. (%)	Reg. No.
Trisodium nitrilotriacetate monohydrate 018662-53-8	95-100	NA	NA

3. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: Inhalation, Ingestion, Eye contact.

ACUTE OVEREXPOSURE EFFECTS:

INHALATION: Inhalation of dust may cause respiratory tract irritation.

INGESTION: May cause nausea, vomiting and diarrhea.

EYE CONTACT: May cause moderate eye irritation.

SKIN CONTACT: Prolonged contact may cause mild irritation.

4. FIRST AID MEASURES

INHALATION:

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

INGESTION:

Rinse mouth with water several times. Do not induce vomiting. Give victim plenty of water. Obtain medical attention immediately.

EYES:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

SKIN:

Gently brush away excess material. Flush skin with plenty of water. Remove contaminated clothing and launder before reuse. Obtain medical attention if irritation develops or persists following exposure.

5. FIRE FIGHTING MEASURES

FLASHPOINT (METHOD):	None
LOWER EXPLOSION LIMIT (% v/v):	Not applicable
UPPER EXPLOSION LIMIT (% v/v):	Not applicable
AUTO-IGNITION TEMPERATURE:	Not applicable

SPECIAL HAZARDS:

May form explosive dust-air mixture.

EXTINGUISHING MEDIA:

Use appropriate media for surrounding fire.

SPECIAL FIREFIGHTING PROCEDURES:

Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires.

HAZARDOUS COMBUSTION PRODUCTS:

Oxides of carbon and nitrogen.

SENSITIVITY TO STATIC DISCHARGE: Yes (dust)

SENSITIVITY TO MECHANICAL IMPACT: No

6 ACCIDENTAL RELEASE MEASURES

Wear specified protective equipment. Prevent from entering sewers or waterways. Sweep, scoop, or vacuum up spill, while taking care not to disperse dust in the air. Place in suitable container(s) for reuse or disposal. Flush remaining traces of material with copious quantities of water.

7 HANDLING AND STORAGE**HANDLING:**

Wear specified protective equipment.

STORAGE REQUIREMENTS:

Keep in a cool, well ventilated place. Keep container dry. Keep away from incompatible materials.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION**SPECIFIC ENGINEERING CONTROLS:**

Use only in a well ventilated area.

PERSONAL PROTECTIVE EQUIPMENT:

Dust mask. Chemical resistant goggles. Rubber gloves. Coveralls. Rubber boots.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Solid
COLOR:	White
ODOR:	None
ODOR THRESHOLD:	Not applicable
SPECIFIC GRAVITY:	1.8
VAPOR PRESSURE:	Not applicable
VAPOR DENSITY (air = 1):	Not applicable
EVAPORATION RATE:	Not applicable
BOILING POINT:	Not applicable
FREEZING POINT:	Not applicable
pH:	11 (1% sol.)
VISCOSITY (c):	Not applicable
SOLUBILITY IN WATER:	50% @ 20°C
COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not available

10 STABILITY AND REACTIVITY**STABILITY:**

Stable.

INCOMPATIBILITY/CONDITIONS OF REACTIVITY:

Strong oxidizers.
HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:
Oxides of carbon and nitrogen.
HAZARDOUS POLYMERIZATION:
Will not occur.

11 TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS:

None known.

SENSITIZATION:

Not known.

CARCINOGENICITY:

Nitroacetic acid and its salts are listed as Group 2B (possibly carcinogenic to humans) carcinogens by the International Agency for Research on Cancer (IARC).

MUTAGENICITY:

Not known.

REPRODUCTIVE TOXICITY:

Not known.

12 ECOLOGICAL INFORMATION

No specific information available.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:

Disposal should be made in accordance with national and local regulations. Consult local waste authorities for direction and/or approvals prior to disposal.

14 TRANSPORT INFORMATION

TDG

Proper Shipping Name: NOT RESTRICTED
UN No.: NA
Hazard Class - Primary:
Hazard Class - Secondary:
Packing Group:

AIR TRANSPORT (ICAO/IATA)

Proper Shipping Name: NOT RESTRICTED
UN No.: NA
Hazard Class - Primary:
Hazard Class - Secondary:
Packing Group:

MARINE TRANSPORT (IMDG/IMO)

Proper Shipping Name: NOT RESTRICTED
UN No.: NA
Hazard Class - Primary:
Hazard Class - Secondary:
Packing Group:
EmS:

15 REGULATORY INFORMATION

WHMIS

D-2A (See Section 11)

D-2B (Eye/skin irritant)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

16 OTHER INFORMATION**ISSUE DATE:** 04/09/2007**REVISIONS:** General Review**PREPARED BY:** Chemical Technology Centre**REFERENCES:**

Supplier's Literature:

CCINFO Web Information Service, Canadian Centre for Occupational Health and Safety, 2007.

International Maritime Dangerous Goods Code, 2002 Edition, International Maritime Organisation, 2002.

Dangerous Goods Regulations, 48th ed., International Air Transport Association, 2007.

TDG Clear Language Regulations, as published in the Canada Gazette Part II, August 2001.

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Revision:	Sec/Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	01/09/95
2	V	Incompatibility and general review/reformat	01/10/98
3	NA	Product name change (formerly Newsco I\$-500)	28/08/00
4	II and V	Corrected CAS no. and incompatible materials; WHMIS three year review.	01/10/01
5	N/A	Reformat	29/09/04
6	N/A	General Review	04/09/07

EYE CONTACT: May cause severe eye irritation. May cause burns with prolonged contact.

SKIN CONTACT: May cause skin irritation or burns with prolonged contact. May be absorbed through the skin and contribute to the symptoms listed under ingestion.

ACUTE TOXICITY:

Ingredient CAS#	%	LC50 (inhalation)	LD50 (oral)
Methanol 000067-56-1	30-60	64000 ppm/4 rat	5600 mg/kg rat
Propargyl alcohol 000107-19-7	5-10	873 ppm/2 rat	20 mg/kg rat

4 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. Only trained personnel should administer oxygen. Get medical attention.

INGESTION:

Rinse mouth with water several times. DO NOT induce vomiting. If vomiting occurs naturally, keep head lower than hips to prevent aspiration. Obtain medical assistance immediately.

EYES:

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

SKIN:

In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and laundry before reuse. Get medical attention if irritation persists.

5 FIRE FIGHTING MEASURES

FLASHPOINT (METHOD): 10°C (TCC)

LOWER EXPLOSION LIMIT (% v/v): Not available

UPPER EXPLOSION LIMIT (% v/v): Not available

AUTO-IGNITION TEMPERATURE: Not available

SPECIAL HAZARDS:

May form flammable vapour-air mixture. This product or a component thereof can flow along surfaces to reach a distant ignition source and flash back.

EXTINGUISHING MEDIA:

Water fog, carbon dioxide, foam, dry chemical.

SPECIAL FIREFIGHTING PROCEDURES:

Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires.

Cool exposed containers with water spray.

HAZARDOUS COMBUSTION PRODUCTS:

Oxides of carbon, nitrogen and sulphur.

SENSITIVITY TO STATIC DISCHARGE: Yes (vapor)

SENSITIVITY TO MECHANICAL IMPACT: No

6 ACCIDENTAL RELEASE MEASURES

Wear specified protective equipment. Remove sources of ignition. Small spills - Cover spill with absorbent material. Scoop absorbed material into a suitable container for disposal. Large spills - Dike to contain. Prevent from entering sewers or waterways. Recover product to suitable containers or vessel for reuse, if possible, or for disposal. Use only explosion proof transfer equipment.

From: Wylie Dallen [wdallen@bjservices.ca]
Sent: Tuesday, August 11, 2009 11:46 AM
To: Knight, Tim

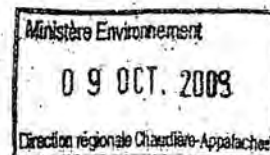
----- Forwarded by Wylie Dallen/BJSCAN/BJSERVICES on 11/08/2009 11:45 AM -----

	BJ SERVICES COMPANY CANADA MATERIAL SAFETY DATA SHEET	Region Canada
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1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: **CI-27**
Product Use: Corrosion inhibitor
Chemical Family: Mixture

Supplier:
BJ Services Company Canada
1300, 801 - 6th Avenue SW
Calgary, Alberta, Canada T2P 4E1
Phone: (403) 531-5151



IN CASE OF EMERGENCY CALL: (403) 531-5151 (24 hrs)

2 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient CAS#	%	ACGIH TWA	ACGIH STEL
Methanol 000067-56-1	30-60	200 ppm, skin	250 ppm, skin
Thiourea polymer 068527-49-1	10-30	NA	NA
Tall oil acid 061790-12-3	10-30	NA	NA
Ethoxylated alcohols, C14-15 068951-67-7	10-30	NA	NA
Propargyl alcohol 000107-19-7	5-10	1 ppm, skin	NA
Alkenes, C>10 alpha- 064743-02-8	1-5	NA	NA

3 HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: Inhalation. Ingestion. Eye contact. Skin contact. Skin absorption.

ACUTE OVEREXPOSURE EFFECTS:

INHALATION: Inhalation of solution vapor or mist may cause respiratory tract irritation. May cause headache, dizziness, nausea and incoordination. May cause visual disturbances.

INGESTION: Ingestion may cause severe irritation or burns to the mouth, throat and esophagus. May cause nausea, dizziness or loss of coordination. May cause visual impairments, ocular damage and possibly blindness if not treated medically.

7 HANDLING AND STORAGE

HANDLING:

Wear specified protective equipment. Use only in a well ventilated area. Use only spark-proof and explosion-proof tools and equipment.

STORAGE REQUIREMENTS:

Keep in a cool, well ventilated place. Keep away from ignition sources. Keep away from heat. Keep away from incompatible materials. Emptied containers may retain hazardous properties.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

SPECIFIC ENGINEERING CONTROLS:

Use only in a well ventilated area. Local exhaust. Adequate ventilation should be provided to keep concentrations below acceptable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Appropriate respiratory protection shall be worn when applied engineering controls are not adequate to protect against inhalation exposure (Cartridge respirator). Chemical resistant goggles. Butyl rubber gloves. Coveralls. Rubber apron. Rubber boots.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Liquid

COLOR: Amber

ODOR: Sweet

ODOR THRESHOLD: Not available

SPECIFIC GRAVITY: 0.9 @ 16°C

VAPOR PRESSURE: 85 mmHg @ 21°C (calculated)

VAPOR DENSITY (air = 1): > 1

EVAPORATION RATE: Not available

BOILING POINT: Not available

FREEZING POINT: < -29°C

pH: 4-6 (5% sol.)

VISCOSITY (C): Not available

SOLUBILITY IN WATER: Dispersible

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

10 STABILITY AND REACTIVITY

STABILITY:

Stable under normal conditions of use.

INCOMPATIBILITY/CONDITIONS OF REACTIVITY:

Strong oxidizers.

HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:

Oxides of carbon, nitrogen and sulphur.

HAZARDOUS POLYMERIZATION:

Will not occur.

11 TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS:

May cause central nervous system depression. Optic nerve damage. Liver and kidney damage. Dermatitis.

SENSITIZATION:

Not known.

CARCINOGENICITY:

None of the components of this product have been listed as carcinogenic by IARC, NTP or OSHA. (IARC- International

Agency for Research on Cancer) (NTP - National Toxicology Program) (OSHA - Occupational Safety & Health Administration (US))

MUTAGENICITY:

Not known.

REPRODUCTIVE TOXICITY:

This product contains methanol (30-60%) which has been reported to cause fetotoxicity and teratogenicity in rats and mice when they were exposed by inhalation to high concentrations that did not produce significant maternal toxicity.

12 ECOLOGICAL INFORMATION

No specific information available.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:

Disposal should be made in accordance with national and local regulations. Consult local waste authorities for direction and/or approvals prior to disposal.

14 TRANSPORT INFORMATION

TDG

Proper Shipping Name: FLAMMABLE LIQUID, TOXIC, N.O.S.

Technical Name(s): Methanol, Propargyl alcohol

UN No.: UN 1992

Hazard Class - Primary: 3

Hazard Class - Secondary: 6.1

Packing Group: II

AIR TRANSPORT (ICAO/IATA)

Proper Shipping Name: FLAMMABLE LIQUID, TOXIC, N.O.S.

Technical Name(s): Methanol, Propargyl alcohol

UN No.: UN 1992

Hazard Class - Primary: 3

Hazard Class - Secondary: 6.1

Packing Group: II

MARINE TRANSPORT (IMDG/IMO)

Proper Shipping Name: FLAMMABLE LIQUID, TOXIC, N.O.S.

Technical Name(s): Methanol, Propargyl alcohol

UN No.: UN 1992

Hazard Class - Primary: 3

Hazard Class - Secondary: 6.1

Packing Group: II

EmS: F-E, S-D

15 REGULATORY INFORMATION

WHMIS:

B-2 (Flammable liquid)

D-1A (Acute toxicity)

D-2A (See Section 11)

D-2B (Eye/skin irritant)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

16 OTHER INFORMATION

ISSUE DATE: 09/04/2009

REVISIONS: Sections

PREPARED BY: Chemical Technology Centre

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

Revision: 4 Status: Approved & Released MSDS

Revision History:

Revision:	Sec/Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	29/02/00
2	All	Converted to 16 Section format.	12/02/03
3	2, 3, 5, 9 and 11	Review/Reformat. Remove HMIRC exemption. Disclose all ingredient info in table. Update LD50 value for methanol. Update flashpoint. Change odor to sweet. Adjust freeze point value and temp for sp gr. Update vapour pressure value. Add more risk phrases to Chronic Effects.	22/03/06
4	3, 5, 9 and 10	Revised hazards, flash point, pH; and incompatible materials.	09/04/09

First Approver

Name: Doug Smith
Title: Field Safety Manager

Approved - 13/04/2009 by Doug Smith

Second Approver

Name:
Title:

History

New MSDS created 10/04/2009 09:07 PM by Nancy Greenwood
First Approver Selected 10/04/2009 09:13 PM by Nancy Greenwood
MSDS submitted for Final Approval by Nancy Greenwood - 10/04/2009
Final Approval 13/04/2009 08:12 AM by Doug Smith

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BJ SERVICES COMPANY CANADA MATERIAL SAFETY DATA SHEET

Region
Canada

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: **FAC-3W**
Product Use: Gellant - Surfactant
Chemical Family: Surfactant mixture

Supplier:
BJ Services Company Canada
1300, 801 - 6th Avenue SW
Calgary, Alberta, Canada T2P 4E1
Phone: (403) 531-5151

IN CASE OF EMERGENCY CALL: (403) 531-5151 (24 hrs)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient CAS#	%	ACGIH TWA	ACGIH STEL
Isopropanol 000067-63-0	10-30	200 ppm	400 ppm
Trimethyloctadecylammonium chloride 000112-03-8	15-40	NA	NA
Sodium xylene sulphonate 001300-72-7	15-40	NA	NA

3. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: Inhalation. Eye contact. Skin contact.

ACUTE OVEREXPOSURE EFFECTS:

INHALATION: Inhalation of solution vapor or mist may cause respiratory tract irritation. Excessive inhalation may cause headache, dizziness and nausea.

INGESTION: Ingestion may cause irritation to the mouth, throat and esophagus. May cause nausea, vomiting and diarrhea.

EYE CONTACT: May cause moderate to severe eye irritation. May cause burns with prolonged contact.

SKIN CONTACT: May cause skin irritation or burns with prolonged contact.

ACUTE TOXICITY:

Ingredient CAS#	%	LC50 (inhalation)	LD50 (oral)
Isopropanol 000067-63-0	10-30	16000 ppm/8 rat	5045 mg/kg rat
Trimethyloctadecylammonium chloride 000112-03-8	15-40	NA	536 mg/kg mouse

4 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. Only trained personnel should administer oxygen. Get medical attention.

INGESTION:

Rinse mouth with water several times. DO NOT induce vomiting. Give victim plenty of water. Obtain medical assistance immediately. If vomiting occurs naturally, keep head lower than hips to prevent aspiration.

EYES:

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

SKIN:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and laundry before reuse. Seek medical attention.

5 FIRE FIGHTING MEASURES

FLASHPOINT (METHOD):

25°C (PMCC)

LOWER EXPLOSION LIMIT (% v/v):

2 (Isopropanol)

UPPER EXPLOSION LIMIT (% v/v):

12 (Isopropanol)

AUTO-IGNITION TEMPERATURE:

399°C (Isopropanol)

SPECIAL HAZARDS:

Flammable. May form flammable vapour-air mixture. This product or a component there of can flow along surfaces to reach a distant ignition source and flash back.

EXTINGUISHING MEDIA:

Water fog, carbon dioxide, alcohol foam, dry chemical.

SPECIAL FIREFIGHTING PROCEDURES:

Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires. Cool exposed containers with water spray.

HAZARDOUS COMBUSTION PRODUCTS:

Oxides of carbon, nitrogen and sulphur.

SENSITIVITY TO STATIC DISCHARGE:

Yes (vapor)

SENSITIVITY TO MECHANICAL IMPACT:

No

6 ACCIDENTAL RELEASE MEASURES

Wear specified protective equipment. Remove sources of ignition. Small spills - Cover spill with absorbent material. Scoop absorbed material into a suitable container for disposal. Large spills - Dike to contain. Prevent from entering sewers or waterways. Recover product to suitable containers or vessel for reuse, if possible, or for disposal. Use only explosion proof transfer equipment.

7 HANDLING AND STORAGE

HANDLING:

Wear specified protective equipment. Use only in a well ventilated area. Use only spark-proof and explosion-proof tools and equipment.

STORAGE REQUIREMENTS:

Keep container tightly closed, in a cool, well ventilated place. Keep away from heat. Keep away from ignition sources. Keep away from incompatible materials. Protect from freezing.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

SPECIFIC ENGINEERING CONTROLS:

Use only in a well ventilated area. Adequate ventilation should be provided to keep concentrations below acceptable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Appropriate respiratory protection shall be worn when applied engineering controls are not adequate to protect against inhalation exposure. Chemical resistant goggles or face shield. Nitrile gloves. Neoprene gloves. Coveralls.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
COLOR:	Clear, pale yellow
ODOR:	Alcohol
ODOR THRESHOLD:	Not available
SPECIFIC GRAVITY:	1.04
VAPOR PRESSURE:	Not available
VAPOR DENSITY (air = 1):	Not available
EVAPORATION RATE:	Not available
BOILING POINT:	Not available
FREEZING POINT:	-10°C
pH:	Not available
VISCOSITY (C):	450 cps @ 45°C
SOLUBILITY IN WATER:	Partial
COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not available

10 STABILITY AND REACTIVITY

STABILITY:

Stable under normal conditions of use.

INCOMPATIBILITY/CONDITIONS OF REACTIVITY:

Strong oxidizers.

HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:

Oxides of carbon, nitrogen and sulphur.

HAZARDOUS POLYMERIZATION:

Will not occur.

11 TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS:

Not determined.

SENSITIZATION:

Not known.

CARCINOGENICITY:

None of the components of this product have been listed as carcinogenic by IARC, NTP or OSHA. (IARC - International Agency for Research on Cancer) (NTP - National Toxicology Program) (OSHA - Occupational Safety & Health Administration (US))

MUTAGENICITY:

Not known.

REPRODUCTIVE TOXICITY:

Not known.

12 ECOLOGICAL INFORMATION

No specific information available

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:

Disposal should be made in accordance with national and local regulations. Consult local waste authorities for direction and/or approvals prior to disposal.

14 TRANSPORT INFORMATION**TDG**

Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.
Technical Name(s): Isopropanol
UN No.: UN 1993
Hazard Class - Primary: 3
Hazard Class - Secondary:
Packing Group: III

AIR TRANSPORT (ICAO/IATA)

Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.
Technical Name(s): Isopropanol
UN No.: UN 1993
Hazard Class - Primary: 3
Hazard Class - Secondary:
Packing Group: III

MARINE TRANSPORT (IMDG/IMO)

Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.
Technical Name(s): Isopropanol
UN No.: UN 1993
Hazard Class - Primary: 3
Hazard Class - Secondary:
Packing Group: III
EmS: F-E, S-E

15 REGULATORY INFORMATION**WHMIS:**

B-2 (Flammable liquid)
D-2B (Eye/skin irritant)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

16 OTHER INFORMATION

ISSUE DATE: 18/07/2006
REVISIONS: Sections 5, 8, 9 and 10
PREPARED BY: Chemical Technology Centre

REFERENCES:

Supplier's Literature.
CCINFO Web Information Service, Canadian Centre for Occupational Health and Safety, 2006.
International Maritime Dangerous Goods Code, 2002 Edition, International Maritime Organisation, 2002.
Dangerous Goods Regulations, 47th ed., International Air Transport Association, 2006.
TDG Clear Language Regulations, as published in the Canada Gazette Part II, August 2001.
Guide to Occupational Exposure Values - 2006, American Conference of Governmental Industrial Hygienists, 2006.

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for

injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

Revision:	Sec/Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	10/01/01
2	IV and IX	Updated flashpoint and dangerous goods packing group.	16/01/01
3	IX	Corrected WHMIS classification.	13/06/01
4	2	Reformat/updated exposure limit.	05/07/04
5	5	Removed hydrogen cyanide statement from hazardous combustion products.	04/07/06
6	5, 8, 9 and 10	Change flashpoint. Remove hydrogen chloride and hydrogen cyanide from haz comb products. Change PPE. Add viscosity value. Remove olefins and tertiary amine salts from haz therm decomp products.	18/07/06



BJ SERVICES COMPANY CANADA MATERIAL SAFETY DATA SHEET

Region
Canada

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: **D-3**
Product Use: Non-emulsifier
Chemical Family: Mixture

Supplier:
BJ Services Company Canada
1300, 801 - 6th Avenue SW
Calgary, Alberta, Canada T2P 4E1
Phone: (403) 531-5151

IN CASE OF EMERGENCY CALL: (403) 531-5151 (24 hrs)

2 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient CAS#	%	ACGIH ID#	ACGIH STEL
Methanol 000067-56-1	1-5	200 ppm, skin	250 ppm, skin
Isopropanol 000067-63-0	60-100	200 ppm	400 ppm
Ethoxylated alcohol, branched 078330-19-5	1-5	NA	NA

3 HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: Inhalation. Ingestion. Eye contact. Skin contact.

ACUTE OVEREXPOSURE EFFECTS:

INHALATION: Inhalation of solution vapor or mist may cause respiratory tract irritation. May cause headache, dizziness, nausea and incoordination.

INGESTION: May cause headache, dizziness, nausea, vomiting, gastrointestinal irritation and central nervous system depression. Minute amounts aspirated into the lungs during ingestion or vomiting may cause severe pulmonary injury.

EYE CONTACT: Vapors are irritating to eyes. May cause severe eye irritation. May cause corneal injury.

SKIN CONTACT: May cause mild skin irritation.

ACUTE TOXICITY:

Ingredient CAS#	%	LC50 Inhalation	LD50 (oral)
Methanol 000067-56-1	1-5	64000 ppm/4 rat	5600 mg/kg rat
Isopropanol 000067-63-0	60-100	16000 ppm/8 rat	5045 mg/kg rat

4 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. Only trained personnel should administer oxygen. Get medical attention.

INGESTION:

Rinse mouth with water several times. DO NOT induce vomiting. Give victim plenty of water. Obtain medical assistance immediately. If vomiting occurs naturally, keep head lower than hips to prevent aspiration.

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.

SKIN:

Wash with soap and water. Remove contaminated clothing and laundry before reuse. Get medical attention if irritation persists.

5 FIRE FIGHTING MEASURES

FLASHPOINT (METHOD):

12°C (TCC)

LOWER EXPLOSION LIMIT (% v/v):

2.0 (Isopropanol)

UPPER EXPLOSION LIMIT (% v/v):

12.0 (Isopropanol)

AUTO-IGNITION TEMPERATURE:

399°C (Isopropanol)

SPECIAL HAZARDS:

Vapors may form explosive mixture with air. This product or a component there of can flow along surfaces to reach a distant ignition source and flash back. Vapor may be ignited by static discharge.

EXTINGUISHING MEDIA:

Water fog, carbon dioxide, foam, dry chemical.

SPECIAL FIREFIGHTING PROCEDURES:

Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires.

Cool exposed containers with water spray.

HAZARDOUS COMBUSTION PRODUCTS:

Oxides of carbon.

SENSITIVITY TO STATIC DISCHARGE: Yes (vapor)

SENSITIVITY TO MECHANICAL IMPACT: Not Available

6 ACCIDENTAL RELEASE MEASURES

Wear specified protective equipment. Remove sources of ignition. Small spills - Cover spill with absorbent material. Scoop absorbed material into a suitable container for disposal. Large spills - Dike to contain. Prevent from entering sewers or waterways. Recover product to suitable containers or vessel for reuse, if possible, or for disposal. Use only explosion proof transfer equipment.

7 HANDLING AND STORAGE

HANDLING:

Use only in a well ventilated area. Use only spark-proof and explosion-proof tools and equipment. Wear specified protective equipment.

STORAGE REQUIREMENTS:

Keep in a cool, well ventilated place. Keep away from ignition sources. Keep away from heat. Keep away from incompatible materials. Keep container closed when not in use.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

SPECIFIC ENGINEERING CONTROLS:

Local exhaust.

PERSONAL PROTECTIVE EQUIPMENT:

Appropriate respiratory protection shall be worn when applied engineering controls are not adequate to protect against inhalation exposure. Cartridge respirator. Chemical resistant goggles. Rubber gloves. Rubber apron. Rubber boots. Coveralls.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
COLOR:	Clear/colorless
ODOR:	Alcohol
ODOR THRESHOLD:	Not available
SPECIFIC GRAVITY:	0.79 @ 25°C
VAPOR PRESSURE:	4.4 kPa @ 20°C (Isopropanol)
VAPOR DENSITY (air = 1):	2.07 (Isopropanol)
EVAPORATION RATE:	1.5 (n-butyl acetate=1) (Isopropanol)
BOILING POINT:	82°C (Isopropanol)
FREEZING POINT:	< -70°C
pH:	4.76 (5% sol.)
VISCOSITY (c):	Not available
SOLUBILITY IN WATER:	Complete
COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not available

10 STABILITY AND REACTIVITY

STABILITY:

Stable under normal conditions of use.

INCOMPATIBILITY/CONDITIONS OF REACTIVITY:

May react violently with strong oxidizers or acids (nitric, sulphuric). Contact with alkali and alkaline earth metals may produce flammable hydrogen gas. Reacts vigorously with aluminum.

HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:

Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION:

Will not occur.

11 TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS:

Prolonged or repeated over exposure may cause central nervous system depression. Dermatitis.

SENSITIZATION:

Not known.

CARCINOGENICITY:

None of the components of this product have been listed as carcinogenic by IARC, NTP or OSHA. (IARC - International Agency for Research on Cancer) (NTP - National Toxicology Program) (OSHA - Occupational Safety & Health Administration (US))

MUTAGENICITY:

Not known.

REPRODUCTIVE TOXICITY:

This product contains methanol (1-5%) which has been reported to cause fetotoxicity and teratogenicity in rats and mice when they were exposed by inhalation to high concentrations that did not produce significant maternal toxicity.

12 ECOLOGICAL INFORMATION

No specific information available.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:

Disposal should be made in accordance with national and local regulations. Consult local waste authorities for direction and/or approvals prior to disposal.

14 TRANSPORT INFORMATION

TDG

Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.
Technical Name(s): Isopropanol, Methanol
UN No.: UN 1993
Hazard Class - Primary: 3
Hazard Class - Secondary:
Packing Group: II

AIR TRANSPORT (ICAO/IATA)

Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.
Technical Name(s): Isopropanol, Methanol
UN No.: UN 1993
Hazard Class - Primary: 3
Hazard Class - Secondary:
Packing Group: II

MARINE TRANSPORT (IMDG/IMO)

Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.
Technical Name(s): Isopropanol, Methanol
UN No.: UN 1993
Hazard Class - Primary: 3
Hazard Class - Secondary:
Packing Group: II
EmS: F-E, S-E

15 REGULATORY INFORMATION**WHITES**

B-2 (Flammable liquid)
D-2A (See Section 11)
D-2B (See Sections 3 and 11)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

16 OTHER INFORMATION

ISSUE DATE: 12/12/2007
REVISIONS: Sections 8 and 9
PREPARED BY: Chemical Technology Centre

REFERENCES:

Supplier's Literature.
CCINPO Web Information Service, Canadian Centre for Occupational Health and Safety, 2007.
International Marine Dangerous Goods Code, 2002 Edition, International Maritime Organisation, 2002.
Dangerous Goods Regulations, 48th ed., International Air Transport Association, 2007.
TDG Clear Language Regulations, as published in the Canada Gazette Part II, August 2001.
Guide to Occupational Exposure Values - 2007, American Conference of Governmental Industrial Hygienists, 2007.

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Revisions:	Sec/Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	21/01/00
2	Sections VI and IX	Teratogenicity (methanol); WHMIS D-2A.	19/12/01
3	2 and 3	Reformat/Review. Update hazardous ingredients in product. Update TWA and STEL values for isopropanol. Update LD50 value for methanol.	11/02/05
4	9	Change specific gravity.	14/12/05
5	8 and 9	General review. Update PPE and physical properties.	12/12/07



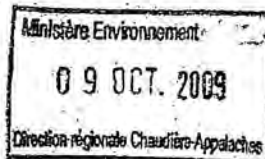
BJ SERVICES COMPANY CANADA
MATERIAL SAFETY DATA SHEET

Region
Canada

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: **FP-12L**
Product Use: **Anti-foamer**
Chemical Family: **Silicon emulsion**

Supplier:
BJ Services Company Canada
1300, 801 - 6th Avenue SW
Calgary, Alberta, Canada T2P 4E1
Phone: (403) 531-5151



IN CASE OF EMERGENCY CALL: (403) 531-5151 (24 hrs)

2 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient: **[REDACTED]**
Hazardous: **[REDACTED]**

3 HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: **Eye contact.**

ACUTE OVEREXPOSURE EFFECTS:

INHALATION: Not a likely exposure route.

INGESTION: Not a likely exposure route. Ingestion of large quantities may cause abdominal discomfort.

EYE CONTACT: Direct contact with solution may cause mild transient eye irritation.

SKIN CONTACT: None known.

4 FIRST AID MEASURES

INHALATION:

None required.

INGESTION:

Rinse mouth out with water. Drink plenty of water. If significant quantities were ingested, seek medical advice.

EYES:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

SKIN:

Wash with soap and water. Remove contaminated clothing and laundry before reuse. Get medical attention if irritation persists.

5 FIRE FIGHTING MEASURES

FLASHPOINT (METHOD):	> 100°C (CC)
LOWER EXPLOSION LIMIT (% v/v):	Not available
UPPER EXPLOSION LIMIT (% v/v):	Not available
AUTO-IGNITION TEMPERATURE:	Not available

SPECIAL HAZARDS:

Product may burn in fire situation after water has evaporated from the mixture.

EXTINGUISHING MEDIA:

Water fog, carbon dioxide, foam, dry chemical.

SPECIAL FIREFIGHTING PROCEDURES:

Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires. Cool exposed containers with water spray.

HAZARDOUS COMBUSTION PRODUCTS:

See Hazardous Thermal Decomposition Products.

SENSITIVITY TO STATIC DISCHARGE: No

SENSITIVITY TO MECHANICAL IMPACT: No

6 ACCIDENTAL RELEASE MEASURES

Wear specified protective equipment. Small spills - Cover spill with absorbent material. Scoop absorbed material into a suitable container for disposal. Large spills - Dike to contain. Prevent from entering sewers or waterways. Recover product to suitable containers or vessel for reuse, if possible, or for disposal.

7 HANDLING AND STORAGE

HANDLING:

Wear specified protective equipment.

STORAGE REQUIREMENTS:

Keep away from incompatible materials. Protect from freezing.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

SPECIFIC ENGINEERING CONTROLS:

Use only in a well ventilated area.

PERSONAL PROTECTIVE EQUIPMENT:

Chemical resistant goggles. Rubber gloves. Coveralls.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:

Liquid

COLOR:

White

ODOR:

Mild

ODOR THRESHOLD:

Not available

SPECIFIC GRAVITY:

1.0 @ 25°C

VAPOR PRESSURE:

Not available

VAPOR DENSITY (air = 1):

Not available

EVAPORATION RATE:

Not available

BOILING POINT:

Not available

FREEZING POINT:

Not available

pH:

Not available

VISCOSITY (C):

Not available

SOLUBILITY IN WATER:

Miscible

COEFFICIENT OF WATER/OIL DISTRIBUTION:

Not available

10 STABILITY AND REACTIVITY

STABILITY:

Stable.

INCOMPATIBILITY/CONDITIONS OF REACTIVITY:

Strong oxidizers.

HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:
Silicon dioxide. Carbon monoxide. Carbon dioxide. Formaldehyde;

HAZARDOUS POLYMERIZATION:
Will not occur.

11 TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS:
None known.

SENSITIZATION:
Not known.

CARCINOGENICITY:
None of the components of this product have been listed as carcinogenic by IARC, NTP or OSHA. (IARC - International Agency for Research on Cancer) (NTP - National Toxicology Program) (OSHA - Occupational Safety & Health Administration (US))

MUTAGENICITY:
Not known.

REPRODUCTIVE TOXICITY:
Not known.

12 ECOLOGICAL INFORMATION

No specific information available

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:
Disposal should be made in accordance with national and local regulations. Consult local waste authorities for direction and/or approvals prior to disposal.

14 TRANSPORT INFORMATION

TDG

Proper Shipping Name: NOT RESTRICTED
UN No.: NA
Hazard Class - Primary:
Hazard Class - Secondary:
Packing Group:

AIR TRANSPORT (ICAO/IATA)

Proper Shipping Name: NOT RESTRICTED
UN No.: NA
Hazard Class - Primary:
Hazard Class - Secondary:
Packing Group:

MARINE TRANSPORT (IMDG/IMO)

Proper Shipping Name: NOT RESTRICTED
UN No.: NA
Hazard Class - Primary:

Hazard Class - Secondary:
Packing Group:
EmS:

15 REGULATORY INFORMATION

WHMIS:

~~Not controlled~~

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

16 OTHER INFORMATION

ISSUE DATE: 22/11/2006
REVISIONS: Reformat / Review
PREPARED BY: Chemical Technology Centre
REFERENCES:

Supplier's Literature.

CCINFO Web Information Service, Canadian Centre for Occupational Health and Safety, 2006.

International Marine Dangerous Goods Code, 2002 Edition, International Maritime Organisation, 2002.

Dangerous Goods Regulations, 47th ed., International Air Transport Association, 2006.

TDG Clear Language Regulations, as published in the Canada Gazette Part II, August 2001.

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Revision:	Sec/Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	01/02/95
2	III and VI	Physical properties, flammability data.	12/01/98
3	N/A	Product name change, formerly Nowasco AFA-2 or Fracmaster Defoamer-1.	14/03/00
4	N/A	Product name change, formerly Nowasco-Fracmaster FP-20L; WHMIS 3 year review.	10/10/00
5	N/A	General review.	07/11/03
6	N/A	Reformat/Review	22/11/06



BJ SERVICES COMPANY CANADA MATERIAL SAFETY DATA SHEET

Region
Canada

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: **AI-275**
Product Use: Acid corrosion inhibitor
Chemical Family: Mixture

Supplier:
BJ Services Company Canada
1300, 801 - 6th Avenue SW
Calgary, Alberta, Canada T2P 4E1
Phone: (403) 531-5151

IN CASE OF EMERGENCY CALL: (403) 531-5151 (24 hrs)

2 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient CAS#	Concentration	ACGIH TLV	ACGIH STEL
1,2,4-Trimethyl benzene 000095-63-6	0.1-1	25 ppm	NA
Formaldehyde 000050-00-0	5-10	NA	CEIL-0.3 ppm, sen
Methanol 000067-58-1	0.1-1	200 ppm, skin	250 ppm, skin
Isopropanol 000067-63-0	10-30	200 ppm	400 ppm
Naphthalene 000091-20-3	1-5	10 ppm, skin	15 ppm, skin
Propargyl alcohol 000107-19-7	1-5	1 ppm, skin	NA
Ethyl octynol 005877-42-9	1-5	NA	NA
Tall oil acid 061790-12-3	5-10	NA	NA
Solvent naphtha (petroleum), heavy arom. 064742-94-5	10-30	NA	NA
Tall oil fatty acid 068188-40-9	5-10	NA	NA
Oxyalkylated alkylphenols 068891-11-2	10-30	NA	NA
Quaternary quinoline derivatives 072480-70-7	5-10	NA	NA

Notes: sen = sensitizer

3 HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: Inhalation. Ingestion. Eye contact. Skin contact. Skin absorption.

ACUTE OVEREXPOSURE EFFECTS:

INHALATION: Inhalation of solution vapor or mist may cause moderate to severe respiratory tract irritation. May cause headache, dizziness, nausea and incoordination. Excessive inhalation may cause chemical pneumonitis or

pulmonary edema.

INGESTION: Harmful if swallowed. May cause irritation or burns to the mouth, throat and stomach. May cause abdominal pain, nausea and vomiting. Minute amounts aspirated into the lungs during ingestion or vomiting may cause severe pulmonary injury. (Product LD50, oral-rat=1400 mg/kg)

EYE CONTACT: May cause severe irritation or burns to the eyes. May cause permanent eye damage.

SKIN CONTACT: May cause severe skin irritation. May cause skin burns. May be absorbed through the skin and contribute to the symptoms listed under inhalation. (Product LD50, dermal-rabbit=630 mg/kg)

ACUTE TOXICITY:

Ingested CAS	Inhalation	LD50 (oral)
1,2,4-Trimethyl benzene 000095-63-6	0,1-1 18 g/m ³ /4 rat	5 g/kg rat
Formaldehyde 000050-00-0	5-10 454 mg/m ³ /4 mouse	100 mg/kg rat
Methanol 000067-56-1	0,1-1 64000 ppm/4 rat	5800 mg/kg rat
Isopropanol 000067-63-0	10-30 16000 ppm/8 rat	5045 mg/kg rat
Naphthalene 000091-20-3	1-5 NA	490 mg/kg rat
Propargyl alcohol 000107-19-7	1-5 873 ppm/2 rat	20 mg/kg rat

4 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. Only trained personnel should administer oxygen. Get medical attention.

INGESTION:

Rinse mouth with water several times. Give victim plenty of water. DO NOT induce vomiting. If vomiting occurs naturally, keep head lower than hips to prevent aspiration. Obtain medical assistance immediately.

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.

SKIN:

In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention if irritation persists.

5 FIRE FIGHTING MEASURES

FLASHPOINT (METHOD): 37.8°C (SFCC)

LOWER EXPLOSION LIMIT (% v/v): Not available

UPPER EXPLOSION LIMIT (% v/v): Not available

AUTO-IGNITION TEMPERATURE: Not available

SPECIAL HAZARDS:

May form flammable vapour-air mixture. This product or a component thereof can flow along surfaces to reach a distant ignition source and flash back.

EXTINGUISHING MEDIA:

Water fog, carbon dioxide, foam, dry chemical.

SPECIAL FIREFIGHTING PROCEDURES:

Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires.

Cool exposed containers with water spray.

HAZARDOUS COMBUSTION PRODUCTS:

Oxides of carbon and nitrogen. Hydrogen chloride.

SENSITIVITY TO STATIC DISCHARGE: Yes (vapor)
SENSITIVITY TO MECHANICAL IMPACT: Not Available

6. ACCIDENTAL RELEASE MEASURES

Wear specified protective equipment. Remove sources of ignition. Small spills - Cover spill with absorbent material. Scoop absorbed material into a suitable container for disposal. Large spills - Dike to contain. Prevent from entering sewers or waterways. Recover product to suitable containers or vessel for reuse, if possible, or for disposal. Use only explosion proof transfer equipment.

7. HANDLING AND STORAGE

HANDLING:

Wear specified protective equipment. Use only spark-proof and explosion-proof tools and equipment. Use only in a well ventilated area.

STORAGE REQUIREMENTS:

Keep container in a well ventilated area. Keep away from incompatible materials. Keep away from heat. Keep away from ignition sources. Keep container closed when not in use. Emptied containers may retain hazardous properties.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

SPECIFIC ENGINEERING CONTROLS:

Use only in a well ventilated area. Mechanical ventilation.

PERSONAL PROTECTIVE EQUIPMENT:

Appropriate respiratory protection shall be worn when applied engineering controls are not adequate to protect against inhalation exposure (Cartridge respirator). Chemical resistant goggles. Nitrile, neoprene or 4H gloves. Rubber apron. Rubber boots. Coveralls.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
COLOR:	Amber
ODOR:	Pungent
ODOR THRESHOLD:	Not available
SPECIFIC GRAVITY:	0.96 - 0.972 @ 16°C
VAPOR PRESSURE:	37.2 mmHg @ 38°C
VAPOR DENSITY (air = 1):	> 1
EVAPORATION RATE:	Not available
BOILING POINT:	Not available
FREEZING POINT:	-23°C (pour pt.)
pH:	Not available
VISCOSITY (C):	Not available
SOLUBILITY IN WATER:	Dispersible
COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not available

10. STABILITY AND REACTIVITY

STABILITY:

Stable under normal conditions of use.

INCOMPATIBILITY/CONDITIONS OF REACTIVITY:

Contact with oxidizing agents.

HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:

Carbon monoxide. Carbon dioxide. Oxides of nitrogen. Hydrogen chloride.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS:

Prolonged or repeated inhalation may cause respiratory ailments. May cause central nervous system depression. May cause liver and kidney damage.

SENSITIZATION:

May cause an allergenic skin response in some individuals.

CARCINOGENICITY:

Formaldehyde, present at 5-10% in this product, is listed as carcinogenic to humans (group 1) by the International Agency for Research on Cancer (IARC). This product contains naphthalene (1-5%). Naphthalene is listed as a group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

MUTAGENICITY:

Not known.

REPRODUCTIVE TOXICITY:

This product contains methanol (0.1-1%) which has been reported to cause fetotoxicity and teratogenicity in rats and mice when they were exposed by inhalation to high concentrations that did not produce significant maternal toxicity.

12 ECOLOGICAL INFORMATION

No specific information available.

13 DISPOSAL CONSIDERATIONS**WASTE DISPOSAL:**

Disposal should be made in accordance with national and local regulations. Consult local waste authorities for direction and/or approvals prior to disposal.

14 TRANSPORT INFORMATION**TDG**

Proper Shipping Name:	FLAMMABLE LIQUID, TOXIC, N.O.S.
Technical Name(s):	Isopropanol, Propargyl alcohol
UN No.:	UN 1992
Hazard Class - Primary:	3
Hazard Class - Secondary:	6.1
Packing Group:	III

AIR TRANSPORT (ICAO/IATA)

Proper Shipping Name:	FLAMMABLE LIQUID, TOXIC, N.O.S.
Technical Name(s):	Isopropanol, Propargyl alcohol
UN No.:	UN 1992
Hazard Class - Primary:	3
Hazard Class - Secondary:	6.1
Packing Group:	III

MARINE TRANSPORT (IMDG/IMO)

Proper Shipping Name:	FLAMMABLE LIQUID, TOXIC, N.O.S.
Technical Name(s):	Isopropanol, Propargyl alcohol
UN No.:	UN 1992
Hazard Class - Primary:	3
Hazard Class - Secondary:	6.1
Packing Group:	III
EmS:	F-E, S-D

15 REGULATORY INFORMATION**WHMIS:**

B-3 (Combustible liquid)

D-1B (Acute toxicity)
D-2A (See Section 11)
D-2B (See Sections 3 and 11)
E (Corrosive liquid)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

16 OTHER INFORMATION

ISSUE DATE: 20/10/2008

REVISIONS: Review

PREPARED BY: Chemical Technology Centre

REFERENCES:

Supplier's Literature.

CCINFO Web Information Service, Canadian Centre for Occupational Health and Safety, 2008.

Dangerous Goods Regulations, 49th ed., International Air Transport Association, 2008.

International Marine Dangerous Goods Code, 2002 Edition, International Maritime Organisation, 2002.

TDG Clear Language Regulations, as published in the Canada Gazette Part II, August 2001.

Guide to Occupational Exposure Values - 2007, American Conference of Governmental Industrial Hygienists, 2007.

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Certificate of Analysis

Request number: **09-291961**

Date Received: 2009-03-13

Date Certificate Issued: 2009-03-18

Certificate Version: 1

- ☒ Official Certificate of Analysis
☐ Preliminary Certificate of Analysis

Client

TALISMAN ENERGY INC

2000, 888 3rd STREET SW
CALGARY, Alberta, Canada
T2P5C5
Telephone: (403) 237-1234
Fax: (403) 237-1902

P.O. Number	Your project ID.	Project Manager
TEC 2850	Waste Water Disposal	M. Terry Wollin

Comments

This version replaces and cancels all earlier version.

NA : Information Not Available

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Certificate of Analysis No. 290943 - Revision 1 - Page 1 of 6

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Bodycote Testing Group
1818 Rte de L'Aéroport - Québec - Québec - Canada - G2G 2P8 - Tel: +1 (418) 871-8722 - Fax: +1 (418) 871-9556



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Request Number: 09-291961

Client: **TALISMAN ENERGY INC**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	Waste Water Disposal	M. Terry Wollin

Sample(s)

Lab. No. 1308287
Your Reference Leclercville #1-
Frac Water
Matrix Waste water
Sampled by M. Vincent Perron
Site sampled Leclercville #1
Date sampled 2009-03-13
Date received 2009-03-13

Parameter(s)

Method:
Reference:

Ammonia (as N)

QC019-88 / Sodium Salicylate colorimetry
MA300 N1.1

Preparation 2009-03-18
Analysis 2009-03-16
Sequential No. 280055
mg/L 6.0

Ammonia (as N)

Arsenic (As)
QC091-08 / Acid digestion (if necessary), ICP-MS analysis
MA200-Met 1.1 R3

Preparation 2009-03-16
Analysis 2009-03-16
Sequential No. 280054
mg/L 0.019

Arsenic (As)

Barium (Ba)
QC087-07 / Acid digestion (if necessary), ICP analysis
MA200-Met 1.1 R3

Preparation 2009-03-16
Analysis 2009-03-16
Sequential No. 280053
mg/L 1.5

Barium (Ba)

BOD5
QC004-92 / Seed : natural wastewater, 20°C incubation, O2 reading
SM5210B & MA315-DBO 1.1

Preparation 2009-03-13
Analysis 2009-03-18
Sequential No. 280021
mg/L O2 430

BOD5

Boron (B)
QC087-07 / Acid digestion (if necessary), ICP analysis
MA200-Met 1.1 R3

Preparation 2009-03-16
Analysis 2009-03-16
Sequential No. 280053
mg/L 4.2

Boron (B)

Cadmium (Cd)
QC087-07 / Acid digestion (if necessary), ICP analysis
MA200-Met 1.1 R3

Preparation 2009-03-16
Analysis 2009-03-16
Sequential No. 280053
mg/L <0.005

Cadmium (Cd)

Chloride
QC032-95 / Thiocyanate Hg colorimetry
SM4500 ClE

Preparation 2009-03-16
Analysis 2009-03-16
Sequential No. 280061
mg/L 2400

Chloride

Certificate of Analysis No. 290943 - Revision 1 - Page 2 of 6

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Client: TALISMAN ENERGY INC

Request Number: 09-291961

P.O. Number	Your Project ID.	Project Manager
TEC 2850	Waste Water Disposal	M. Terry Wollin

Sample(s)

Lab. No. 1308287
Your Reference Leclercville #1-
Frac Water
Matrix Waste water
Sampled by M. Vincent Perron
Site sampled Leclercville #1
Date sampled 2009-03-13
Date received 2009-03-13

Parameter(s)

Method
Reference

Chromium (Cr)

QC087-07 / Acid digestion (if necessary), ICP analysis
MA200-Met 1.1 R3

Chromium (Cr)

Preparation 2009-03-16
Analysis 2009-03-16
Sequential No. 280053
mg/L <0.01

COD

QC005-95 / closed acid reflux colorimetry
SM5220D / MA315 DCO1.0

Preparation 2009-03-15
Analysis 2009-03-15
Sequential No. 280052
mg/L 3200

Copper (Cu)

QC087-07 / Acid digestion (if necessary), ICP analysis
MA200-Met 1.1 R3

Preparation 2009-03-16
Analysis 2009-03-16
Sequential No. 280053
mg/L <0.01

Copper (Cu)

Iron (Fe)

QC087-07 / Acid digestion (if necessary), ICP analysis
MA200-Met 1.1 R3

Preparation 2009-03-16
Analysis 2009-03-16
Sequential No. 280053
mg/L 9.1

Iron (Fe)

Lead (Pb)

QC087-07 / Acid digestion (if necessary), ICP analysis
MA200-Met 1.1 R3

Preparation 2009-03-16
Analysis 2009-03-16
Sequential No. 280053
mg/L <0.03

Lead (Pb)

Mercury

QC068-96 / Acid digestion, AA (cold-vapor) analysis
SM3112B/ MA200 Hg 1.0

Preparation 2009-03-16
Analysis 2009-03-16
Sequential No. 280050
mg/L 0.0020

Mercury

Nickel (Ni)

QC087-07 / Acid digestion (if necessary), ICP analysis
MA200-Met 1.1 R3

Preparation 2009-03-16
Analysis 2009-03-16
Sequential No. 280053
mg/L 0.07

Nickel (Ni)

Certificate of Analysis No. 290843 - Revision 1 - Page 3 of 6

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Request Number: 09-291961

Client: **TALISMAN ENERGY INC**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	Waste Water Disposal	M. Terry Wollin

Sample(s)

Lab. No. 1308287
Your Reference Leclercville #1-
Frac Water
Matrix Waste water
Sampled by M. Vincent Perron
Site sampled Leclercville #1
Date sampled 2009-03-13
Date received 2009-03-13

Parameter(s)		
Method		
Reference		
Nitrite-Nitrate (as N)	Preparation	2009-03-16
QC028-95 / Cadmium reduction, colorimetry SM4500NO3 F	Analysis	2009-03-16
	Sequential No.	279955
Nitrite-Nitrate (as N)	mg/L	0.82
pH	Preparation	2009-03-13
QC021-92 / pH-meter (with temperature-compensating device) MA100-pH1.1/SM4500-H+ B	Analysis	2009-03-13
	Sequential No.	280040
pH	mg/L	8.1
Phenols (4AAP)	Preparation	2009-03-16
QC044-97 / distillation, colorimetry SM 5530 B,C / MA404 / Phe2.1 / MA400 Phe2.0	Analysis	2009-03-16
	Sequential No.	280076
Phenols (4AAP)	mg/L	0.003
Sulfates (SO4)	Preparation	2009-03-16
QC090-06 / IC analysis MA300 Ions1.2 / MA303 Anions 1.0 / SM 4110B	Analysis	2009-03-16
	Sequential No.	280088
Sulfates (SO4)	mg/L	62
Suspended solids	Preparation	2009-03-13
QC033-95 / Filtration, Dried at 105 °C, Gravimetry SM 2540 D / MA115 S.S.1.1 / MA 104 SS 1.1	Analysis	2009-03-16
	Sequential No.	280008
Suspended solids	mg/L	33
Total cyanide (as CN)	Preparation	2009-03-16
QC015-92 / distillation, colorimetry SM4500-CN C, E / MA300 CN 1.1	Analysis	2009-03-17
	Sequential No.	280077
Total cyanide (as CN)	mg/L CN	<0.005
Total phosphorus (as P)	Preparation	2009-03-16
QC017-97 / acid digestion, colorimetry ascorbic acid prep: SM4500-P B4, E & analysis: SM4500-P F / MA315-P 1.0	Analysis	2009-03-16
	Sequential No.	280081
Total phosphorus (as P)	mg/L	<0.8

Certificate of Analysis No. 280943 - Revision 1 - Page 4 of 6

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Request Number: **09-291961**

Client: **TALISMAN ENERGY INC**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	Waste Water Disposal	M. Terry Wollin

Sample(s)

Lab. No. 1308287
Your Reference Leclercville #1-
Frac Water
Matrix Waste water
Sampled by M. Vincent Perron
Site sampled Leclercville #1
Date sampled 2009-03-13
Date received 2009-03-13

Parameter(s)

Method
Reference

Total Sulfide

QC016-02 / distillation (if necessary), methylene blue colorimetry
MA-300-S 1.1 / SM4500-S2 D

Preparation 2009-03-16
Analysis 2009-03-17
Sequential No. 280097

Sulfides (as H₂S)

mg/L H₂S <0.04

Sulfides (as S₂-)

mg/L S <0.04

Zinc (Zn)

Preparation 2009-03-16
Analysis 2009-03-16
Sequential No. 280053

QC087-07 / Acid digestion (if necessary), ICP analysis
MA200-Met 1.1 R3

Zinc (Zn)

mg/L 0.08

Request Number: **09-291961**Client: **TALISMAN ENERGY INC**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	Waste Water Disposal	M. Terry Wollin

Sample(s)

Lab. No. 1308287
Your Reference Leclercville #1-
Frac Water

Matrix Waste water
Sampled by M. Vincent Perron

Site sampled Leclercville #1

Date sampled 2009-03-13
Date received 2009-03-13

Parameter(s)

Method
Reference

Petroleum hydrocarbons (C10-C50)

QC063-97 / hexane extraction, GC-FID analysis
MA410-Hyd.1.0

Preparation 2009-03-14
Analysis 2009-03-16
Sequential No. 280041

Petroleum hydrocarbons (C10-C50)

µg/L 1700

Total Oil and Grease

QC061-97 / hexane extraction, gravimetry
EPA1564 / MA415 HGT 1.0

Preparation 2009-03-14
Analysis 2009-03-14
Sequential No. 280042

Total Oil and Grease

mg/L 4

Comments:

1308287 Leclercville #1-Frac Water Total phosphorus : Limit increased due to the sample matrix. BOD5: The sample was received (and analysed) on a not frozen fraction

Note: Results pertain only to the samples submitted for analysis.

Alain Perron
Alain Perron, chemist



Certificate of Analysis No. 290943 - Revision 1 - Page 6 of 6

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Certificate of Analysis

Request Number: 09-291961

Client: **TALISMAN ENERGY INC**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	Waste Water Disposal	M. Terry Wollin

Quality Control Results (CQ)

Parameters (Sequential ID No.)	Units	RDL	Blank	Certified Control	
				Result	Expected Range
Chloride					
Sequential ID No.: 280061					
Chloride	mg/L	< 0.5	<0.5	26	21.3 - 28.8
Total cyanide (as CN)					
Sequential ID No.: 280077					
Total cyanide (as CN)	mg/L CN	< 0.005	<0.005	0.21	0.16 - 0.24
BOD5					
Sequential ID No.: 280021					
BOD5	mg/L O2	< 2	< 2	190	150 - 250
COD					
Sequential ID No.: 280052					
COD	mg/L	< 5	<5	110	80 - 120
Total Sulfide					
Sequential ID No.: 280097					
Sulfides (as H2S)	mg/L H2S	< 0.04	<0.04	2.0	1.7 - 2.6
Sulfides (as S2-)	mg/L S	< 0.04	<0.04	NA	NA
Mercury					
Sequential ID No.: 280050					
Mercury	mg/L	< 0.0001	<0.0001	0.0048	0.0035 - 0.0065
Petroleum hydrocarbons (C10-C50)					
Sequential ID No.: 280041					
Petroleum hydrocarbons (C10-C50)	µg/L	< 100	<100	1900	1400 - 3400
Total Oil and Grease					
Sequential ID No.: 280042					
Total Oil and Grease	mg/L	< 1	< 1	46	35 - 65
Sulfates (SO4)					
Sequential ID No.: 280088					
Sulfates (SO4)	mg/L	< 0.5	<0.5	9.9	8.8 - 11.5

Comments

Sequential ID no. 280053 : Zinc: Positive blank was not subtracted of samples

RDL : Reported Detection Limit

Appendix 1 of Certificate no.290943 - Page 1 of 3

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Certificate of AnalysisRequest Number: **09-291961**Client: **TALISMAN ENERGY INC**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	Waste Water Disposal	M. Terry Wollin

Quality Control Results (CQ)

Parameters (Sequential ID No.)	Units	RDL	Blank	Certified Control	
				Result	Expected Range
Barium (Ba) Sequential ID No.: 280053					
Barium (Ba)	mg/L	< 0.01	<0.01	1.0	0.8 - 1.2
Boron (B) Sequential ID No.: 280053					
Boron (B)	mg/L	< 0.02	<0.02	1.0	0.8 - 1.1
Cadmium (Cd) Sequential ID No.: 280053					
Cadmium (Cd)	mg/L	< 0.005	<0.005	1.0	0.8 - 1.2
Chrome (Cr) Sequential ID No.: 280053					
Chromium (Cr)	mg/L	< 0.01	<0.01	1.0	0.8 - 1.2
Copper (Cu) Sequential ID No.: 280053					
Copper (Cu)	mg/L	< 0.01	<0.01	1.0	0.8 - 1.2
Iron (Fe) Sequential ID No.: 280053					
Iron (Fe)	mg/L	< 0.05	<0.05	5.1	4.35 - 5.65
Arsenic (As) Sequential ID No.: 280054					
Arsenic (As)	mg/L	< 0.001	<0.001	0.021	0.016 - 0.024
Nickel (Ni) Sequential ID No.: 280053					
Nickel (Ni)	mg/L	< 0.02	<0.02	1.0	0.8 - 1.2
Lead (Pb) Sequential ID No.: 280053					
Lead (Pb)	mg/L	< 0.03	<0.03	1.0	0.8 - 1.2

Comments

Sequential ID no. 280053 : Zinc: Positive blank was not subtracted of samples

RDL : Reported Detection Limit

Appendix 1 of Certificate no.290943 - Page 2 of 3

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Certificate of Analysis

Request Number: **09-291961**

Client: **TALISMAN ENERGY INC**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	Waste Water Disposal	M. Terry Wollin

Quality Control Results (CQ)

Parameters (Sequential ID No.)	Units	RDL	Blank	Certified Control	
				Result	Expected Range
Zinc (Zn) Sequential ID No.: 280053					
Zinc (Zn)	mg/L	< 0.02	0.03	1.0	0.8 - 1.2
Ammonia (as N) Sequential ID No.: 280055					
Ammonia (as N)	mg/L	< 0.5	<0.5	20	17 - 23
Nitrite-Nitrate (as N) Sequential ID No.: 279955					
Nitrite-Nitrate (as N)	mg/L	< 0.02	<0.02	1.0	0.85 - 1.15
Phenols (4AAP) Sequential ID No.: 280075					
Phenols (4AAP)	mg/L	< 0.002	<0.002	0.028	0.02 - 0.04
pH Sequential ID No.: 280040					
pH		NA	NA	7.0	6.6 - 7
Total phosphorus (as P) Sequential ID No.: 280081					
Total phosphorus (as P)	mg/L	< 0.03	<0.03	1.3	1.05 - 1.57
Suspended solids Sequential ID No.: 280008					
Suspended solids	mg/L	< 4	<4	120	88 - 132

Comments

Sequential ID no. 280053 : Zinc; Positive blank was not subtracted of samples

RDL : Reported Detection Limit

Appendix 1 of Certificate no.290943 - Page 3 of 3

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Certificate of Analysis

Request number: 10-335038



Date Received: 2010-07-07

Date Certificate Issued: 2010-07-13

Certificate Version: 1

- ☐ Official Certificate of Analysis
☒ Preliminary Certificate of Analysis

Client

La Société Talisman Énergie Inc.

2000, 888 3rd STREET SW
CALGARY, Alberta, Canada
T2P5C5

Telephone : (403) 237-1234
Fax : (403) 237-1902

Preliminary

P.O. Number	Your project ID.	Project Manager
TEC 2850	AF 77026 Leclercville HZ 1A	M. François Corriveau

Comments

This version replaces and cancels all earlier version.

NA : Information Not Available

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Certificate of Analysis No. 334948 - Revision 1 - Page 1 of 6

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Certificate of Analysis

Client: **La Société Tallman Énergie Inc.**

Request Number: **10-335038**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF 77026 Leclercville HZ 1A	M. François Corriveau

Sample(s)

Lab. No. **1485422**
Your Reference **Leclercville HZ 1A**

Matrix **Waste water**
Sampled by **CLIENT**

Site sampled **Leclercville HZ 1A**

Date sampled **2010-07-07**
Date received **2010-07-07**

Preliminary

Parameter(s)

Method

Reference

Ammonia (as N)

QC019-96 / Sodium Salicylate colorimetry
MA. 300 - N 1.1 R2

Preparation **2010-07-08**

Analysis **2010-07-09**

Sequential No. **316058**

Ammonia (as N)

mg/L **2.1**

Arsenic (As)

QC091-08 / Acid digestion (if necessary), ICP-MS analysis
MA. 200 - Met 1.1 R4

Preparation **2010-07-08**

Analysis **2010-07-09**

Sequential No. **315935**

Arsenic (As)

mg/L **0.002**

Barium (Ba)

QC087-07 / Acid digestion (if necessary), ICP analysis
MA. 200 - Met 1.1 R4

Preparation **2010-07-08**

Analysis **2010-07-09**

Sequential No. **315933**

Barium (Ba)

mg/L **1.1**

BOD5

QC004-92 / Seed : natural wastewater, 20°C incubation, O2 reading
SMS210 B / MA. 315 - DOB 1.1

Preparation **2010-07-08**

Analysis **2010-07-13**

Sequential No. **315987**

BOD5

mg/L O2 **230**

State of sample at the reception

(1 = Not frozen / 2 = Frozen)

1

Boron (B)

QC087-07 / Acid digestion (if necessary), ICP analysis
MA. 200 - Met 1.1 R4

Preparation **2010-07-08**

Analysis **2010-07-09**

Sequential No. **315933**

Boron (B)

mg/L **2.0**

Cadmium (Cd)

QC087-07 / Acid digestion (if necessary), ICP analysis
MA. 200 - Met 1.1 R4

Preparation **2010-07-08**

Analysis **2010-07-09**

Sequential No. **315933**

Cadmium (Cd)

mg/L **<0.005**

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Certificate of Analysis

Client: **La Société Talisman Énergie Inc.**

Request Number: **10-335038**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF 77026 Leclercville HZ 1A	M. François Corriveau

Sample(s)

Lab. No. **1485422**
Your Reference **Leclercville HZ 1A**

Matrix **Waste water**
Sampled by **CLIENT**

Site sampled **Leclercville HZ 1A**

Date sampled **2010-07-07**
Date received **2010-07-07**

Preliminary

Parameter(s)		
Method:		
Reference:		
Chloride	Preparation	2010-07-12
QC032-95 / Thiocyanate Hg colorimetry SM4500 Cl E / MA. 303 - Anions 1.0 R1	Analysis	2010-07-12
	Sequential No.	318120
Chloride	mg/L	450
Chrome (Cr)	Preparation	2010-07-08
QC087-07 / Acid digestion (if necessary), ICP analysis MA. 200 - Mét 1.1 R4	Analysis	2010-07-09
	Sequential No.	315933
Chromium (Cr)	mg/L	0.01
COD	Preparation	2010-07-08
QC005-95 / Closed acid reflux colorimetry SM5220 D / MA. 315 - DCQ 1.0 R4	Analysis	2010-07-08
	Sequential No.	315890
COD	mg/L	340
Copper (Cu)	Preparation	2010-07-08
QC087-07 / Acid digestion (if necessary), ICP analysis MA. 200 - Mét 1.1 R4	Analysis	2010-07-09
	Sequential No.	315933
Copper (Cu)	mg/L	0.01
Iron (Fe)	Preparation	2010-07-08
QC087-07 / Acid digestion (if necessary), ICP analysis MA. 200 - Mét 1.1 R4	Analysis	2010-07-09
	Sequential No.	315933
Iron (Fe)	mg/L	5.3
Lead (Pb)	Preparation	2010-07-08
QC087-07 / Acid digestion (if necessary), ICP analysis MA. 200 - Mét 1.1 R4	Analysis	2010-07-09
	Sequential No.	315933
Lead (Pb)	mg/L	<0.03
Mercury	Preparation	2010-07-11
QC068-96 / Acid digestion, AA (cold-vapor) analysis SM3112 B / MA. 200 - Hg 1.0 R4	Analysis	2010-07-11
	Sequential No.	316099
Mercury	mg/L	<0.0001

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Certificate of Analysis

Client: **La Société Talsman Énergie Inc.**

Request Number: **10-335038**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF 77026 Leclercville HZ 1A	M. François Corriveau

Sample(s)

Lab. No. **1485422**
Your Reference **Leclercville HZ 1A**

Matrix **Waste water**
Sampled by **CLIENT**

Site sampled **Leclercville HZ 1A**

Date sampled **2010-07-07**

Date received **2010-07-07**

Preliminary

Parameter(s)	Method	Reference	Preparation	Analysis	Sequential No.	mg/L
Nickel (Ni)	QC028-07 / Acid digestion (if necessary), ICP analysis MA. 200 - Mét 1.1 R4		2010-07-08	2010-07-09	315933	<0.02
Nitrite-Nitrate (as N)	QC028-05 / Cadmium reduction, colorimetry SM4500NO3F / MA.300-NO3 1.0 R1 / MA.303-NO3 1.0 R4		2010-07-08	2010-07-08	315916	<0.02
pH	QC021-02 / pH-meter (compensation at 20°C) SM4500 H + B / MA. 100 - pH 1.1 R1		2010-07-07	2010-07-07	315873	8.0
Phenols (4AAP)	QC044-07 / Distillation, colorimetry SM5530 B / MA. 404-LPhé. 2.2 / MA. 400-Phé 1.0		2010-07-09	2010-07-09	315994	0.021
Sulfates (SO4)	QC090-08 / IC analysis SM4110 B / MA300-Ions 1.2 R2 / MA303-Anions 1.0 R1		2010-07-09	2010-07-09	316003	30
Suspended solids	QC033-05 / Filtration, dried at 105 °C, gravimetry SM2540 D / MA. 115 - S.S. 1.1 R3		2010-07-09	2010-07-12	316060	49
Total cyanide (as CN)	QC015-02 / Distillation with hydroxylamine, colorimetry SM4500-CN N / MA. 300 - CN 1.1 R4		2010-07-08	2010-07-08	315905	0.011

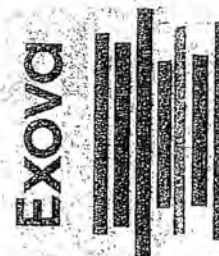
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Certificate of Analysis

Client: **La Société Talisman Énergie Inc.**

Request Number: **10-335038**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF 77026 Leclercville HZ 1A	M. François Corriveau

Sample(s)

Lab. No. 1485422
Your Reference Leclercville HZ 1A

Matrix Waste water
Sampled by CLIENT

Site sampled Leclercville HZ 1A

Date sampled 2010-07-07
Date received 2010-07-07

Preliminary

Parameter(s)

Method
Reference

Total phosphorus (as P)

QC017-97 / Persulfate autoclave digestion, colorimetry acid
SM4500-P F / MA. 315 - P 1.0 R4

Preparation

Analysis

Sequential No. 316228

mg/L

Pending

Total phosphorus (as P)

Total Sulfide

QC018-92 / Distillation (if necessary), methylene blue colorimetry
MA. 300 - S 1.1 R3 / SM4500-S2 D

Preparation

Analysis

Sequential No. 315906

mg/L H2S

1.7

Sulfides (as H2S)

mg/L S

1.6

Sulfides (as S2-)

Zinc (Zn)

QC087-07 / Acid digestion (if necessary), ICP analysis
MA. 200 - Met 1.1 R4

Preparation

Analysis

Sequential No. 315933

mg/L

0.17

Zinc (Zn)

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Certificate of Analysis No. 334948 - Revision 1 - Page 5 of 6

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Certificate of Analysis

Client: **La Société Talisman Énergie Inc.**

Request Number: **10-335038**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF 77026 Leclercville HZ 1A	M. François Corriveau

Sample(s)

Lab. No. **1485422**
Your Reference **Leclercville HZ 1A**

Matrix **Waste water**
Sampled by **CLIENT**

Site sampled **Leclercville HZ 1A**

Date sampled **2010-07-07**
Date received **2010-07-07**

Parameter(s)

Method
Reference

Petroleum hydrocarbons (C10-C50)

QC083-97 / Hexane extraction, GC-FID analysis
MA. 400 - Hyd. 1.1

Preparation **2010-07-08**
Analysis **2010-07-09**
Sequential No. **315950**
µg/L **12000**

Petroleum hydrocarbons (C10-C50)

Total Oil and Grease

QC061-97 / Hexane extraction, gravimetry
EPA1664 / MA. 400 - HGT 1.1

Preparation **2010-07-09**
Analysis **2010-07-10**
Sequential No. **316054**
mg/L **15**

Comments:

1485422 **Leclercville HZ 1A** **DB05 : Échantillon reçu (et analysé) non congelé**

Note: Results pertain only to the samples submitted for analysis.

Christian Robert
Christian Robert, chemist



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Certificate of Analysis No. 334948 - Revision 1 - Page 6 of 6

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Certificate of AnalysisRequest number: **09-304013**

Date Received: 2009-07-23

Date Certificate Issued: 2009-08-04

Certificate Version: 1

- ☒ Official Certificate of Analysis
☐ Preliminary Certificate of Analysis

Client**TALISMAN ENERGY INC**

2000, 888 3rd STREET SW.
CALGARY, Alberta, Canada
T2P5C5
Telephone : (403) 237-1234
Fax : (403) 237-1902

P.O. Number	Your project ID.	Project Manager
TEC 2850	AF74651 St-Edouard # 1	M. Terry Wollin

Comments

This version replaces and cancels all earlier version.

NA : Information Not Available

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Request Number: 09-304013Client: **TALISMAN ENERGY INC**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF74651 St-Edouard # 1	M. Terry Wollin

Sample(s)

Lab. No. 1357661
Your Reference Frac Fluids St-Edouard #1
Matrix Waste water
Sampled by M. Vincent Perron
Site sampled St-Edouard #1
Date sampled 2009-07-23
Date received 2009-07-23

Parameter(s)Method
Reference**Ammonia (as N)**QC019-06 / Sodium Salicylate colorimetry
MA. 300 - N 1.1 R1

Preparation 2009-07-24
Analysis 2009-07-24
Sequential No. 290941

mg/L 14

Arsenic (As)QC091-08 / Acid digestion (if necessary), ICP-MS analysis
MA. 200 - M&M 1.1 R3

Preparation 2009-07-24
Analysis 2009-07-24
Sequential No. 290970

mg/L 0.024

Barium (Ba)QC087-07 / Acid digestion (if necessary), ICP analysis
MA. 200 - M&M 1.1 R3

Preparation 2009-07-24
Analysis 2009-07-24
Sequential No. 290965

mg/L 2.4

BOD5QC004-92 / Seed : natural wastewater, 20°C incubation, O2 reading
SM5210 B / MA. 315 - DBO 1.1

Preparation 2009-07-30
Analysis 2009-08-04
Sequential No. 291372

mg/L O2 480

BOD5QC087-07 / Acid digestion (if necessary), ICP analysis
MA. 200 - M&M 1.1 R3

Preparation 2009-07-24
Analysis 2009-07-24
Sequential No. 290965

mg/L 3.0

Boron (B)QC087-07 / Acid digestion (if necessary), ICP analysis
MA. 200 - M&M 1.1 R3

Preparation 2009-07-24
Analysis 2009-07-24
Sequential No. 290965

mg/L <0.005

Cadmium (Cd)QC032-95 / Thiocyanate Hg colorimetry
SM4500 Cl E

Preparation 2009-07-24
Analysis 2009-07-24
Sequential No. 290984

mg/L 1900

Chloride

Certificate of Analysis No. 303853 - Revision 1 - Page 2 of 6

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Request Number: **09-304013**Client: **TALISMAN ENERGY INC**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF74651 St-Edouard # 1	M. Terry Wollin

Sample(s)

Lab. No. **1357661**
Your Reference **Frac Fluids St-Edouard #1**

Matrix **Waste water**
Sampled by **M. Vincent Perron**

Site sampled **St-Edouard #1**

Date sampled **2009-07-23**
Date received **2009-07-23**

Parameter(s)

Method
Reference

Chrome (Cr)

QC087-07 / Acid digestion (if necessary), ICP analysis
MA. 200 - Met 1.1 R3

Preparation **2009-07-24**
Analysis **2009-07-24**
Sequential No. **290965**
mg/L **<0.01**

Chromium (Cr)**COD**

QC005-95 / Closed acid reflux, colorimetry
SM5220 D / MA. 315 - DCO 1.0 R4

Preparation **2009-07-24**
Analysis **2009-07-24**
Sequential No. **290922**
mg/L **1900**

COD**Copper (Cu)**

QC087-07 / Acid digestion (if necessary), ICP analysis
MA. 200 - Met 1.1 R3

Preparation **2009-07-24**
Analysis **2009-07-24**
Sequential No. **290965**
mg/L **<0.01**

Copper (Cu)**Iron (Fe)**

QC087-07 / Acid digestion (if necessary), ICP analysis
MA. 200 - Met 1.1 R3

Preparation **2009-07-24**
Analysis **2009-07-24**
Sequential No. **290965**
mg/L **5.3**

Iron (Fe)**Lead (Pb)**

QC087-07 / Acid digestion (if necessary), ICP analysis
MA. 200 - Met 1.1 R3

Preparation **2009-07-24**
Analysis **2009-07-24**
Sequential No. **290965**
mg/L **<0.03**

Lead (Pb)**Mercury**

QC068-96 / Acid digestion, AA (cold-vapor) analysis
SM3112 B / MA. 200 - Hg 1.0 R4

Preparation **2009-07-24**
Analysis **2009-07-24**
Sequential No. **290950**
mg/L **< 0.0001**

Mercury**Nickel (Ni)**

QC087-07 / Acid digestion (if necessary), ICP analysis
MA. 200 - Met 1.1 R3

Preparation **2009-07-24**
Analysis **2009-07-24**
Sequential No. **290965**
mg/L **0.04**

Nickel (Ni)

Certificate of Analysis No. 303853 - Revision 1 - Page 3 of 6

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Request Number: 09-304013

Client: TALISMAN ENERGY INC

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF74651 St-Edouard # 1	M. Terry Wollin

Sample(s)

Lab. No. 1357661
Your Reference Frac Fluids St-Edouard #1
Matrix Waste water
Sampled by M. Vincent Perroch
Site sampled St-Edouard #1
Date sampled 2009-07-23
Date received 2009-07-23

Parameter(s)	Method	Preparation	Analysis	Sequential No.	mg/L
Nitrite-Nitrate (as N)	QC028-95 / Cadmium reduction, colorimetry SM4500NO3 F	2009-07-24	2009-07-24	290969	<0.02
Nitrite-Nitrate (as N)					
pH	QC021-92 / pH-meter (with temperature-compensating device) SM4500-H+ B / MA. 100 - pH 1.1	2009-07-23	2009-07-23	290896	8.2
pH					
Phenols (4AAP)	QC044-97 / Distillation, colorimetry SM5530 B,C / MA. 404-I Phé 2.2 / MA. 400- Phé 2.0	2009-07-24	2009-07-24	290919	0.12
Phenols (4AAP)					
Sulfates (SO4)	QC090-08 / IC analysis SM4110 B / MA300-Ions 1.2 R2 / MA303-Anions 1.0 R1	2009-07-24	2009-07-24	290914	160
Sulfates (SO4)					
Suspended solids	QC033-95 / Filtration, dried at 105 °C, gravimetry SM2540 D / MA.115-S.S. 1.1 R2 / MA.104-S.S. 1.1	2009-07-23	2009-07-24	290905	39
Suspended solids					
Total cyanide (as CN)	QC015-92 / Distillation with hydroxylamine, colorimetry MA. 300 - CN 1.1 R4	2009-07-27	2009-07-27	291039	0.041
Total cyanide (as CN)					
Total phosphorus (as P)	QC017-97 / Persulfate autoclave digestion, colorimetry acid SM4600-P F / MA. 315 - P 1.0 R4	2009-07-24	2009-07-24	290915	0.03
Total phosphorus (as P)					

Certificate of Analysis No. 303853 - Revision 1 - Page 4 of 6

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Request Number: 09-304013

Client: TALISMAN ENERGY INC

P.O. Number	Your Project ID:	Project Manager
TEC 2850	AF74651 St-Edouard # 1	M. Terry Wollin

Sample(s)

Lab. No. 1357661
Your Reference Frac Fluids St-Edouard #1
Matrix Waste water
Sampled by M. Vincent Perron
Site sampled St-Edouard #1

Date sampled 2009-07-23
Date received 2009-07-23

Parameter(s)

Method
Reference

Total Sulfide

QC016-92 / Distillation (if necessary), methylene blue colorimetry
MA. 300 - S 1.1 / SM4500-S2 D

Preparation 2009-07-24
Analysis 2009-07-24
Sequential No. 290917
mg/L H₂S <0.04
mg/L S <0.04

Sulfides (as H₂S)Sulfides (as S₂-)**Zinc (Zn)**

QC087-07 / Acid digestion (if necessary), ICP analysis
MA. 200 - Met 1.1 R3

Preparation 2009-07-24
Analysis 2009-07-24
Sequential No. 290965

Zinc (Zn)

mg/L 0.11

Request Number: **09-304013**Client: **TALISMAN ENERGY INC**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF74651 St-Edouard # 1	M. Terry Wollin

Sample(s)

Lab. No. 1357661
Your Reference Frac Fluids St-Edouard #1
Matrix Waste water
Sampled by M. Vincent Perron
Site sampled St-Edouard #1
Date sampled 2009-07-23
Date received 2009-07-23

Parameter(s)Method
Reference**Petroleum hydrocarbons (C10-C50)**QC063-97 / hexane extraction, GC-FID analysis
MA410-Hyd.1.0

Preparation 2009-07-23
Analysis 2009-07-24
Sequential No. 290850

Petroleum hydrocarbons (C10-C50)

µg/L 43000

Total Oil and GreaseQC061-97 / hexane extraction, gravimetry
EPA1664 / MA415 HGT 1.0

Preparation 2009-07-23
Analysis 2009-07-24
Sequential No. 290714

Total Oil and Grease

mg/L 5720

Comments:

1357661 Frac Fluids St-Edouard #1 DBO5 : Échantillon reçu non congelé; analyse réalisée en reprise sur une portion congelée

Note: Results pertain only to the samples submitted for analysis.

Alain Perron
Alain Perron, chemist



Certificate of Analysis No. 303853 - Revision 1 - Page 6 of 6

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Certificate of Analysis

Request Number: **09-304013**

Client: **TALISMAN ENERGY INC**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF74651 St-Edouard # 1	M. Terry Wollin

Quality Control Results (CQ)

Parameters (Sequential ID No.)	Units	RDL	Blank	Certified Control	
				Result	Expected Range
Chloride					
Sequential ID No.: 290984					
Chloride	mg/L	< 0.5	<0.5	25	21.3 - 28.8
Total cyanide (as CN)					
Sequential ID No.: 291039					
Total cyanide (as CN)	mg/L CN	< 0.005	<0.005	0.18	0.16 - 0.24
BOD5					
Sequential ID No.: 291372					
BOD5	mg/L O2	< 2	< 2	190	150 - 250
COD					
Sequential ID No.: 290922					
COD	mg/L	< 5	<5	100	80 - 120
Total Sulfide					
Sequential ID No.: 290917					
Sulfides (as H2S)	mg/L H2S	< 0.04	<0.04	2.1	1.7 - 2.8
Sulfides (as S2-)	mg/L S	< 0.04	<0.04	NA	NA
Mercury					
Sequential ID No.: 290950					
Mercury	mg/L	< 0.0001	< 0.0001	0.0043	0.0035 - 0.0065
Petroleum hydrocarbons (C10-C50)					
Sequential ID No.: 290850					
Petroleum hydrocarbons (C10-C50)	µg/L	< 100	< 100	1800	1400 - 3400
Total Oil and Grease					
Sequential ID No.: 290714					
Total Oil and Grease	mg/L	< 1	< 1	41	35 - 65
Sulfates (SO4)					
Sequential ID No.: 290914					
Sulfates (SO4)	mg/L	< 0.5	<0.5	10	8.5 - 11.5

Comments

Sequential ID no. 290714 : Huiles et graisses minérales (gravimétrie) : Contrôle qualité acceptable en fonction des résultats des échantillons (non-dét.)
Sequential ID no. 290965 : Zinc : Blanc positif non soustrait des échantillons

RDL : Reported Detection Limit

Appendix 1 of Certificate no.303853 - Page 1 of 3

Bodycote Testing Group

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Certificate of AnalysisRequest Number: **09-304013**Client: **TALISMAN ENERGY INC**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF74651 St-Edouard # 1	M. Terry Wollin

Quality Control Results (CQ)

Parameters (Sequential ID No.)	Units	RDL	Blank	Certified Control	
				Result	Expected Range
Barium (Ba)					
Sequential ID No.: 290965					
Barium (Ba)	mg/L	< 0.01	<0.01	1.1	0.8 - 1.2
Boron (B)					
Sequential ID No.: 290965					
Boron (B)	mg/L	< 0.02	<0.02	0.99	0.9 - 1.1
Cadmium (Cd)					
Sequential ID No.: 290965					
Cadmium (Cd)	mg/L	< 0.005	<0.005	1.0	0.8 - 1.2
Chrome (Cr)					
Sequential ID No.: 290965					
Chromium (Cr)	mg/L	< 0.01	<0.01	1.0	0.8 - 1.2
Copper (Cu)					
Sequential ID No.: 290965					
Copper (Cu)	mg/L	< 0.01	<0.01	1.0	0.8 - 1.2
Iron (Fe)					
Sequential ID No.: 290965					
Iron (Fe)	mg/L	< 0.05	<0.05	5.0	4.35 - 5.65
Arsenic (As)					
Sequential ID No.: 290970					
Arsenic (As)	mg/L	< 0.001	<0.001	0.020	0.016 - 0.024
Nickel (Ni)					
Sequential ID No.: 290965					
Nickel (Ni)	mg/L	< 0.02	<0.02	1.0	0.8 - 1.2
Lead (Pb)					
Sequential ID No.: 290965					
Lead (Pb)	mg/L	< 0.03	<0.03	1.0	0.8 - 1.2

Comments

Sequential ID no: 290714 : Huiles et graisses minérales (gravimétrie) : Contrôle qualité acceptable en fonction des résultats des échantillons (non-dét)
Sequential ID no. 290965 : Zinc : Blanc positif non soustrait des échantillons

RDL : Reported Detection Limit

Appendix 1 of Certificate no.303853 - Page 2 of 3

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Certificate of AnalysisRequest Number: **09-304013**Client: **TALISMAN ENERGY INC**

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF74651 St-Edouard # 1	M. Terry Wollin

Quality Control Results (CQ)

Parameters (Sequential ID No.)	Units	RDL	Blank	Certified Control	
				Result	Expected Range
Zinc (Zn) Sequential ID No.: 290965					
Zinc (Zn)	mg/L	< 0.02	0.03	1.0	0.8 - 1.2
Ammonia (as N) Sequential ID No.: 290941					
Ammonia (as N)	mg/L	< 0.02	<0.02	0.78	0.7 - 0.94
Nitrite-Nitrate (as N) Sequential ID No.: 290969					
Nitrite-Nitrate (as N)	mg/L	< 0.02	<0.02	0.97	0.85 - 1.15
Phenols (4AAP) Sequential ID No.: 290919					
Phenols (4AAP)	mg/L	< 0.002	<0.002	0.028	0.02 - 0.04
pH Sequential ID No.: 290896					
pH		NA	NA	7.0	6.6 - 7
Total phosphorus (as P) Sequential ID No.: 290915					
Total phosphorus (as P)	mg/L	< 0.01	<0.01	1.4	1.05 - 1.57
Suspended solids Sequential ID No.: 290905					
Suspended solids	mg/L	< 4	<4	110	88 - 132

Comments

Sequential ID no. 290714 : Huiles et graisses minérales (gravimétrie) : Contrôle qualité acceptable en fonction des résultats des échantillons (non-dét.)
Sequential ID no. 290965 : Zinc : Blanc positif non soustrait des échantillons

RDL : Reported Detection Limit

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2010-02-03

2010-02-10

1

☐ Preliminary Certificate of Analysis

La Société Talisman Énergie Inc.

CALGARY, Alberta, Canada

T2P5C5

Telephone : (403) 237-1234

Fax: (403) 237-1902

P.O. Number	Your project ID.	Project Manager
TEC.2850	AF75511-St-Édouard IA HZ	M. Vincent Perron

NA : Information Not Available

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Certificate of Analysis

Client: La Société Talisman Énergie Inc.

Request Number: 10-321054

P.O. Number	Your Project ID:	Project Manager
TEG 2860	AF75511-St-Édouard-IA HZ	M. Vincent Perron

Sample(s):

Lab. No. 1430729
Your Reference Flow back water

Matrix: Waste water
Sampled by: M. Vincent Perron

Site sampled: St-Édouard-IA HZ

Date sampled: 2010-02-03
Date received: 2010-02-03

Parameter(s)	Method	Reference	Preparation	Analysis	Sequential No.	mg/L
Ammonia (as N)	CC019-96 / Sodium salicylate colorimetry MA 300 - N 1.1 R2		2010-02-05	2010-02-05	305833	6.1
Ammonia (as N)						
Arsenic (As)	CC061-08 / Acid digestion (if necessary), ICP-MS analysis MA 200 - Mat 1.1 R4		2010-02-04	2010-02-05	305789	0.008
Arsenic (As)						
Barium (Ba)	CC087-07 / Acid digestion (if necessary), ICP analysis MA 200 - Mat 1.1 R4		2010-02-04	2010-02-09	305788	2.6
Barium (Ba)						
BOD5	CC004-92 / Seed: natural wastewater, 20°C incubation, O2 reading SMS210 B / MA 315 - QBQ 1.1		2010-02-04	2010-02-09	305760	400
BOD5						
Boron (B)	CC067-07 / Acid digestion (if necessary), ICP analysis MA 200 - Mat 1.1 R4		2010-02-04	2010-02-09	305788	2.5
Boron (B)						
Cadmium (Cd)	CC087-07 / Acid digestion (if necessary), ICP analysis MA 200 - Mat 1.1 R4		2010-02-04	2010-02-09	305788	<0.005
Cadmium (Cd)						
Chlorides	CC090-08 / IC analysis SM4110 B / MA300-Ions 1.2 R2 / MA303-Anions 1.0 R1		2010-02-09	2010-02-09	305003	1000
Chlorides						

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Certificate of Analysis No. 321044 - Revision 1 - Page 2 of 6

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Québec
Québec
Canada
G2G 2P8

Sans fil: +1 866-365-2310
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F: +1 (418) 871-9556
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Certificate of Analysis

Client: La Société Talisman Énergie Inc.

Request Number: 10-321054

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF75511-St-Édouard 1A HZ	M. Vincent Perron

Sample(s)

Lab. No. 1430729
Your Reference Flow back water

Matrix Waste water
Sampled by M. Vincent Perron

Site sampled St-Édouard 1A HZ

Date sampled 2010-02-03
Date received 2010-02-03

Parameter(s)	Method	Preparation	Analysis
Reference			
Chromium (Cr)	QC087-07 / Acid digestion (if necessary), ICP analysis MA 200 - MA 1.1 R4	2010-02-04	2010-02-09
		Sequential No.	305788
		mg/L	0.02
COD	QC085-95 / Closed acid reflux colorimetry SH5220 D/MA 315 - DCO 1.0 R4	2010-02-08	2010-02-08
		Sequential No.	305916
		mg/L	740
Copper (Cu)	QC087-07 / Acid digestion (if necessary), ICP analysis MA 200 - MA 1.1 R4	2010-02-04	2010-02-09
		Sequential No.	305788
		mg/L	<0.01
Iron (Fe)	QC087-07 / Acid digestion (if necessary), ICP analysis MA 200 - MA 1.1 R4	2010-02-04	2010-02-09
		Sequential No.	305788
		mg/L	5.5
Lead (Pb)	QC087-07 / Acid digestion (if necessary), ICP analysis MA 200 - MA 1.1 R4	2010-02-04	2010-02-09
		Sequential No.	305788
		mg/L	0.05
Mercury	QC088-88 / Acid digestion, AA (cold-vapor) analysis SM3112 B / MA 200 - Hg 1.0 R4	2010-02-08	2010-02-08
		Sequential No.	305917
		mg/L	<0.0001
Nickel (Ni)	QC087-07 / Acid digestion (if necessary), ICP analysis MA 200 - MA 1.1 R4	2010-02-04	2010-02-09
		Sequential No.	305788
		mg/L	0.06

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Certificate of Analysis No. 321044 - Revision 1 - Page 3 of 6

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1818 Rue de l'Aéroport
Québec
Québec
Canada
G2G 2P8

Sans frais: +1-866-365-2310
T: +1 (418) 871-6722
F: +1 (418) 871-9556
E: info@exova.com
W: www.exova.com



Certificate of Analysis

Client: La Société Tailsman Énergie Inc.

Request Number: 10-321054

P.O. Number	Your Project ID	Project Manager
TEC 2850	AF75511-St-Édouard IA HZ	M. Vincent Perron

Sample(s)

Lab. No. 1430729
Your Flow back water
Reference

Matrix Waste water
Sampled by M. Vincent Perron

Site sampled St-Édouard IA HZ

Date sampled 2010-02-03
Date received 2010-02-03

Parameter(s)

Method
Reference

Nitrite-Nitrate (as N)

QC028-95 / Cadmium reduction, colorimetry
SM4500-NO3F / MA-300-NO3 1.0 R1 / MA-303-NO3 1.0 R4

Preparation 2010-02-05
Analysis 2010-02-05
Sequential No. 305822

Nitrite-Nitrate (as N)

mg/L 0.21

pH

QC021-92 / pH meter (compensation at 20°C)
SM4500 H + B / MA-100- pH 1.1 R1

Preparation 2010-02-03
Analysis 2010-02-03
Sequential No. 305731

pH

8.4

Phenols (4AAP)

QC044-97 / Distillation, colorimetry
SM5530 B / MA-404-PhA 2.2 / MA-400-PhA 1.0

Preparation 2010-02-04
Analysis 2010-02-04
Sequential No. 305758

Phenols (4AAP)

mg/L 0.004

Sulfates (SO4)

QC090-08 / IC analysis
SM4110 B / MA300-Ions 1.2 R2 / MA303-Anions 1.0 R1

Preparation 2010-02-04
Analysis 2010-02-04
Sequential No. 305770

Sulfates (SO4)

mg/L 150

Suspended solids

QC033-95 / Filtration, dried at 105 °C, gravimetry
SM2540 D / MA-115- S.S. 1.1-R3

Preparation 2010-02-03
Analysis 2010-02-04
Sequential No. 305747

Suspended solids

mg/L 49

Total cyanide (as CN)

QC015-92 / Distillation with hydroxylamine, colorimetry
SM4500-CN H / MA-300- CN 1.1 R4

Preparation 2010-02-09
Analysis 2010-02-10
Sequential No. 305967

Total cyanide (as CN)

mg/L CN 0.027

Total phosphorus (as P)

QC017-97 / Persulfate autoclave digestion, colorimetry acid
SM4500-P F / MA-315- P 1.0 R4

Preparation 2010-02-09
Analysis 2010-02-09
Sequential No. 305850

Total phosphorus (as P)

mg/L 0.06

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Certificate of Analysis No. 321044 - Revision 1 - Page 4 of 6

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Exova
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Québec
Québec
Canada
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Sans frais: +1 866-365-2310
T: +1 (418) 871-8722
F: +1 (418) 871-9556
E: info@exova.com
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Certificate of Analysis

Client: La Société Talisman Énergie Inc.

Request Number: 10-321054

P.O. Number	Your Project ID.	Project Manager
TEC 2860	AF76511-St-Edouard IA HZ	M. Vincent Perron

Sample(s)

Lab. No. 1430729
Your Flow back water
Reference

Matrix Waste water
Sampled by M. Vincent Perron

Site sampled St-Edouard IA HZ

Date sampled 2010-02-03
Date received 2010-02-03

Parameter(s)

Method
Reference

Total Sulfide

QC018-02 / Distillation (if necessary), methylene blue colorimetry
MA. 300 - S 1.1 R3 / SM4500-S2 D.

Sulfides (as H₂S)

Sulfides (as S₂-)

Preparation 2010-02-05
Analysis 2010-02-05
Sequential No. 305757
mg/L H₂S <0.04
mg/L S <0.04

Zinc (Zn)

QC087-07 / Acid digestion (if necessary); ICP analysis.
MA. 200 - MA1 1.1 R4

Zinc (Zn)

Preparation 2010-02-04
Analysis 2010-02-09
Sequential No. 305788
mg/L 0.60

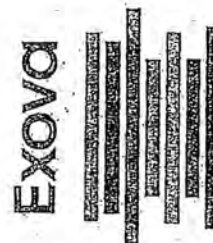
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Certificate of Analysis No. 321044 - Revision 1 - Page 5 of 6

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The above-mentioned samples will be retained for a period of 90 days following the issue of this certificate with the exception of microbiology samples or as instructed by the client.
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Québec
Québec
Canada
G2G 2P8

Sans frais +1 866-365-2310
R: +1 (418) 871-8722
F: +1 (418) 871-9556
E: info@exova.com
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Certificate of Analysis

Client: La Société Talisman Énergie Inc.

Request Number: 10-321054

P.O. Number	Your Project ID.	Project Manager
TEC 2850	AF75511-St-Édouard IA HZ	M. Vincent Perron

Sample(s)

Lab. No. 1430729
Your Reference Flow back water

Matrix Waste water
Sampled by M. Vincent Perron

Site sampled St-Édouard IA HZ

Date sampled 2010-02-03
Date received 2010-02-03

Parameter(s)

Method
Reference

Petroleum hydrocarbons (C10-C50)

QC083-97 / Hexane extraction, GC-FID analysis
MA 410 - Hyd. 1:0

Préparation 2010-02-05
Analysis 2010-02-08
Sequential No. 305869

Petroleum hydrocarbons (C10-C50)

µg/L 100000

Total Oil and Grease

QC081-97 / Hexane extraction, gravimetry
EPA1684 / MA 400 - HGT 1.1

Préparation 2010-02-04
Analysis 2010-02-08
Sequential No. 305797

Total Oil and Grease

mg/L 91 > 30

Comments:

1430729 Flow back water

Quelque le résultat d'huiles et graisses totales devrait être égal ou supérieur à celui des hydrocarbures pétroliers, l'écart entre les résultats se situe à l'intérieur de l'erreur analytique pour ces deux paramètres. DBQ5: Échantillon reçu (et analysé) n

Note: Results pertain only to the samples submitted for analysis.

Christian Robert
Christian Robert, chemist



Exova
1818 Rue de l'Aéroport
Québec
Québec
Canada
G2G 2P8

Sans frais +1 866-365-2310
T: +1 (418) 871-8722
F: +1 (418) 871-9556
E: info@exova.com
W: www.exova.com



Certificat d'analyses

Client: La Société Talisman Énergie Inc.

Request Number: 10-321054

P.O. Number	Your Project ID	Project Manager
TEC 2850	AF76544-St-Édouard IA HZ	M. Vincent Perron

Quality Control Results (CQ)

Parameters (Sequential ID No.)	Units	RDL	Blank	Certified Control	
				Result	Expected Range
Total cyanide (as CN) Sequential ID No.: 305967					
Total cyanide (as CN)	mg/L CN	< 0.005	< 0.005	0.20	0.16 - 0.24
BOD ₅ Sequential ID No.: 305760					
BOD ₅	mg/L O ₂	< 2	< 2	190	150 - 250
COD Sequential ID No.: 305916					
COD	mg/L	< 5	< 5	100	80 - 120
Total Sulfide Sequential ID No.: 305767					
Sulfides (as H ₂ S)	mg/L H ₂ S	< 0.04	< 0.04	1.7	1.6 - 2.4
Sulfides (as S ₂)	mg/L S	< 0.04	< 0.04	NA	NA
Mercury Sequential ID No.: 305917					
Mercury	mg/L	< 0.0001	< 0.0001	0.0052	0.0035 - 0.0085
Petroleum hydrocarbons (C10-C50) Sequential ID No.: 305889					
Petroleum hydrocarbons (C10-C50)	µg/L	< 100	< 100	1700	1400 - 3400
Total Oil and Grease Sequential ID No.: 305797					
Total Oil and Grease	mg/L	< 1	< 1	42	35 - 65
Chlorides Sequential ID No.: 306003					
Chlorides	mg/L	< 0.5	< 0.5	10	8.5 - 11.5
Sulfates (SO ₄) Sequential ID No.: 305770					
Sulfates (SO ₄)	mg/L	< 0.5	< 0.5	9.9	8.5 - 11.5
Barium (Ba) Sequential ID No.: 305788					
Barium (Ba)	mg/L	< 0.01	< 0.01	1.1	0.8 - 1.2

Comments

RDL : Reported Detection Limit

Appendix 1 of Certificate no. 321044 - Page 1 of 3

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Québec
Québec
Canada
G2G 2P8

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T: +1 (418) 871-6722
F: +1 (418) 871-9553
E: info@exova.com
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Certificat d'analyses

Client: La Société Talisman Énergie Inc.

Request Number: 10-321054

P.O. Number	Your Project ID.	Project Manager
TEC 2860	AF75611-St-Édouard IA HZ	M. Vincent Perron

Quality Control Results (CQ)

Parameters (Sequential ID No.)	Units	RDL	Blank	Certified Control	
				Result	Expected Range
Boron (B) Sequential ID No.: 305788					
Boron (B)	mg/L	<0.02	<0.02	1.1	0.9 - 1.1
Cadmium (Cd) Sequential ID No.: 305788					
Cadmium (Cd)	mg/L	<0.005	<0.005	0.96	0.8 - 1.2
Chromium (Cr) Sequential ID No.: 305788					
Chromium (Cr)	mg/L	<0.01	<0.01	0.94	0.8 - 1.2
Copper (Cu) Sequential ID No.: 305788					
Copper (Cu)	mg/L	<0.01	<0.01	1.1	0.8 - 1.2
Iron (Fe) Sequential ID No.: 305788					
Iron (Fe)	mg/L	<0.05	<0.05	5.1	4.5 - 5.5
Arsenic (As) Sequential ID No.: 305789					
Arsenic (As)	mg/L	<0.001	<0.001	0.017	0.016 - 0.024
Nickel (Ni) Sequential ID No.: 305788					
Nickel (Ni)	mg/L	<0.02	<0.02	0.98	0.8 - 1.2
Lead (Pb) Sequential ID No.: 305788					
Lead (Pb)	mg/L	<0.03	<0.03	1.0	0.8 - 1.2
Zinc (Zn) Sequential ID No.: 305788					
Zinc (Zn)	mg/L	<0.02	<0.02	0.99	0.8 - 1.2
Ammonia (as N) Sequential ID No.: 305834					
Ammonia (as N)	mg/L	<0.5	<0.5	17	13.9 - 18.9

Comments

RDL : Reported Detection Limit

Appendix 1 of Certificate no. 321044 - Page 2 of 3

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Certificat d'analyses

Client: La Société Tallisman Énergie Inc.

Request Number: 10-321054

P.O. Number	Your Project ID	Project Manager
TEC 2850	AF75511-St-Édouard IA HZ	M. Vincent Perron

Quality Control Results (CQ)

Parameters (Sequential ID No.)	Units	RDL	Blank	Certified Control	
				Result	Expected Range
Nitrite-Nitrate (as N) Sequential ID No.: 305822					
Nitrite-Nitrate (as N)	mg/L	< 0.02	< 0.02	0.89	0.85 - 1.15
Phenols (4AAP) Sequential ID No.: 305758					
Phenols (4AAP)	mg/L	< 0.002	< 0.002	0.029	0.024 - 0.04
pH Sequential ID No.: 305731					
pH		NA	NA	7.0	6.8 - 7.2
Total phosphorus (as P) Sequential ID No.: 305850					
Total phosphorus (as P)	mg/L	< 0.01	< 0.01	1.9	1.49 - 2.23
Suspended solids Sequential ID No.: 305747					
Suspended solids	mg/L	< 4	< 4	100	88 - 132

Comments

RDL : Reported Detection Limit

Appendix 1 of Certificate no.321044 - Page 3 of 3

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PROVINCE DE QUÉBEC

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Demanderesse

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MINISTÈRE DU DÉVELOPPEMENT DURABLE,
DE L'ENVIRONNEMENT ET DES PARCS

Organisme

**LISTE DES 7 DOCUMENTS JOINTS
À NOTRE LETTRE DU 11 JUILLET 2012**

Bernard, Roy (Justice - Québec)

Palais de justice

1, rue Notre-Dame Est, bureau 8.00

Montréal (Québec) H2Y 1B6

Téléphone : 514 393-2336

Télécopieur : 514 873-7074

BB1721 / N/D: CM-2012-000396

Marie-Josée Bourgeault, avocate