ROYAL NICKEL CORPORATION

309 DA2

Projet d'exploitation du gisement de nickel
Dumont à Launay

6211-08-013

PROJET DUMONT

Étude d'impact sur l'environnement et le milieu social

Réponses aux questions et commentaires de l'Agence canadienne d'évaluation environnementale

1re série

Mars 2013
Projet : 111-15275-01

GENIVAR

ÉTUDE D'IMPACT SUR L'ENVIRONNEMENT ET LE MILIEU SOCIAL.

PROJET DUMONT

RÉPONSES AUX QUESTIONS ET COMMENTAIRES

$1^{\text{ÈRE}}$ SÉRIE

PAR ROYAL NICKEL CORPORATION (RNC)

Présenté à

L'Agence canadienne sur l'évaluation environnementale

Par

GENIVAR inc.

Approuvé par : ______________________________

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1. INTRODUCTION

1.7 Selon la directive, le promoteur identifiera et justifiera clairement la délimitation spatiale retenue pour chaque composante de l'environnement étudiée. Un tableau synthèse présentant ces délimitations et leur justification devra être présenté dans l'étude d'impact pour faciliter la compréhension du lecteur.

Le promoteur doit fournir l'information demandée.

Selon la directive, la zone d'étude englobe minimalement les composantes et activités du projet énumérées à la section 1.5.1 et devra s'étendre pour inclure toute la zone d'influence de ceux-ci, c'est-à-dire la zone à l'intérieur de laquelle se feront sentir les effets environnementaux directs et indirects des composantes du projet.

Nous constatons que la zone d'étude locale n'est pas toujours cohérente avec les zones d'influence de certains effets du projet : par exemple, l'émission de poussière s'étend au-delà de la zone d'étude locale. Ce commentaire s'applique aussi la zone d'extension maximale du rabattement.

Le promoteur doit apporter les correctifs nécessaires ou justifier ce choix

Réponse :

La sélection des zones d'étude prend en compte l'étendue spatiale des impacts ainsi que leur représentation cartographique à une échelle appropriée. Le défi que pose le projet Dumont découle de la grande étendue couverte par les infrastructures minières, qui demande d'englober un grand territoire pour tenir compte de tous les impacts directs et indirects du projet. Or, lorsque l'on englobe un très grand territoire, il devient impossible de représenter précisément des éléments ponctuels sur ce même territoire (échelle cartographique plus petite). Tel que précisé à la section 6.1 et représenté sur la carte 6.1 du volume 1 de l'étude d'impact sur l'environnement et le milieu social (EIES) du projet Dumont, trois zones d'étude ont été définies pour documenter la grande majorité des impacts du projet Dumont, soit une zone d'étude locale pour les impacts sur le milieu naturel, une zone d'étude locale élargie pour certaines composantes du milieu humain (p. ex. la planification et l'utilisation du territoire), ainsi qu'une zone d'étude régionale pour le reste des composantes sociales et économiques du milieu humain et les effets cumulatifs.

Malgré la définition de trois cadres géographiques permettant de documenter adéquatement la grande majorité des impacts, cela n'empêche pas de considérer et de traiter des impacts spécifiques qui pourraient se manifester à l'extérieur des limites des zones d'étude. D'ailleurs, les exemples cités par l'ACÉE (zones d'influence du rabattement de la nappe phréatique et d'émission des poussières) constituent des cas spécifiques pour lesquels les zones d'étude considérées excèdent celles définies pour englober l'ensemble du territoire où l'impact se fera ressentir.

Le tableau 1 résume les délimitations considérées pour le traitement des impacts de chacune des composantes du milieu.

Tableau 1 Justification des zones d'étude pour chacune des composantes du milieu

Composante du milieu	Zone d'étude			
	Locale	Locale élargie	Régionale	Spécifique
Climat				Station météorologique d'Amos
Qualité de l'air				Zone rectangulaire de 14,5 x 10,75 km, incluant Launay et Villemontel (figure 3 de l'annexe 22 – volume 3).
Ambiance sonore				Zone d'étude locale élargie pour y inclure Villemontel (carte 2 de l'annexe 23 – volume 4). Impacts significatifs circonscrits dans la zone d'étude locale (cartes 4-13 de l'annexe 23).
Géologie	X			
Géomorphologie	X			Avec contextualisation stratigraphique régionale (carte 6.3 du volume 1).
Hydrogéologie				Zone d'étude locale avec extension dans sa portion sud-est pour englober la zone d'influence du rabattement de la nappe phréatique (carte 7.1 du volume 1).
Hydrographie et hydrologie				Bassin versant de la rivière Villemontel (carte 6.5 du volume 1 avec emphase dans la zone d'étude locale).
Eau de surface et sédiment	X			Zone d'étude locale élargie pour englober le bassin de la rivière Chicobi, le lac Villemontel et un plus grand tronçon de la rivière Villemontel (carte 6.6 du volume 1).
Végétation	X			
Milieux humides	X			Aussi prise en compte d'un périmètre de 4 km autour de la zone d'étude locale (carte 6.9 du volume 1).

Tableau 1 Justification des zones d’étude pour chacune des composantes du milieu (suite)

Composante du milieu	Zone d’étude			
	Locale	Locale élargie	Régionale	Spécifique
Ichtyofaune	X			Zone d’étude locale élargie pour englober le bassin de la rivière Chicobi, et un plus grand tronçon de la rivière Villemontel (carte 6.10 du volume 1).
Herpétofaune	X			
Avifaune	X			
Mammifère	X			
Espèce à statut particulier	X			
Planification et aménagement du territoire		X		
Population et économie			X	
Utilisation du territoire	X	X	X	
Présence autochtone				Communauté de Pikogan
Infrastructures			X	
Paysage	X			
Patrimoine et archéologie				Secteurs du ruisseau sans nom 1 et du lac à la Savane au nord de la route 111 (figure 1 de l’annexe 15 – volume 2, partie 2).

2.2.2 Selon la directive les éléments concernant la fabrique d'explosif doivent être détaillés :

- **le plan détaillé des bâtiments et la distance qui les sépare d'éléments vulnérables tels que des logements, des routes, des camps, des lignes de chemin de fer, des plans d'eau, etc. Il faut décrire les infrastructures, notamment les suivantes : les poudrières d'explosifs et de détonateurs, le stockage du combustible, le stockage du nitrate d'ammonium, la zone d'entretien et de lavage, les camions de traitement, leur zone de stationnement, les bureaux, les entrepôts, les bâtiments, etc. Le promoteur doit démontrer qu'il a satisfait aux exigences en matière de distances de sécurité prescrites par la Division de la réglementation des explosifs de RnCan;**
- **des renseignements sur les installations temporaires d'explosifs qui seront utilisées pour démarrer le projet (les mêmes que ci-dessus).**

Le promoteur doit fournir l'information demandée.

Selon la directive le promoteur doit décrire de façon détaillée les composantes du projet, les infrastructures, les ouvrages connexes et accessoires liés au projet

Le promoteur doit fournir l'information sur les modes de gestion de l'acide sulfurique et des autres produits chimiques qui seront utilisés.

Réponse :

Tel que mentionné à la section 5.5.5 du volume 1 de l'EIES du projet Dumont, le site est situé à au moins 1 km de toutes infrastructures construites. Or, selon le tableau des quantités-distances de l'annexe A de RnCan (2008), l'atelier d'assemblage d'explosifs se trouve bien au-delà des distances minimales requises pour assurer la sécurité de la population (tableau 2). Précisons que la route la plus près (la route du 6^{e} au 10^{e} rang) affiche un débit de moins de 200 véhicules par jour (voir l'annexe 7 du volume 2 [partie 1] de l'EIES). Dans un tel cas, la distance minimale requise pour un dépôt d'explosifs dont la capacité d'entreposage est de 90 000 kg est de 360 m (RnCan, 2008). Le tableau 2 présente les distances approximatives séparant l'atelier d'explosifs du projet Dumont et les principaux éléments sensibles du milieu environnant.

Tableau 2 Distance de l’atelier d’assemblage d’explosifs des principaux éléments sensibles

Élément	Distance (km)
Marge est du lac Doyon	3,3
Route du 6^{e} au 10^{e} rang	2,6
Marge ouest de la halde de minerai de basse teneur	0,9
Marge nord-est du parc à résidus	0,7
Noyau urbain de Launay	6,2
Résidence la plus proche (Launay)	5,9
Abri sommaire (camp de chasse) le plus proche	1,6
Chemin de fer du CN	5,7

Au moment du dépôt de l’EIES, le plan détaillé des bâtiments et la description des infrastructures de la fabrique d’explosifs n’étaient pas disponibles et ne le sont toujours pas puisque l’étude de faisabilité ne sera déposée qu’en juin 2013. Tous les détails requis seront cependant inclus dans la licence de fabrique d’explosifs qui sera déposée à RnCan en vertu de la Loi sur les explosifs (LRC, 1985, ch. E-17).

Il n’est pas encore possible de fournir de plans de la fabrique d’explosifs, car le choix entre les deux fournisseurs (Dyno Nobel et Orica) n’est pas encore fait et que le concept de chacun est différent. Dyno préconise actuellement une usine en vrac de 70 000 kg de capacité d’entreposage (un entrepôt de détonateurs et deux bâtiments pour les produits explosifs et les accessoires).

Durant les trois premières années (années -2 et -1 de la construction et préproduction et année 1 de l’exploitation), les fournisseurs s’alimenteront toutefois en émulsion à partir de camions en provenance de leur site de transfert déjà autorisé.

L’acide sulfurique et les autres produits chimiques seront gérés conformément aux règles de sécurité d’usage (voir annexe 1) pour prévenir les risques d’exposition et pour gérer efficacement les actions en cas d’incident.

L’acide sulfurique sera transporté jusqu’au complexe industriel par camion-citerne. Les citernes sont généralement conçues en acier inoxydable et peuvent transporter jusqu’à 25 à 40 tonnes de produit. Le chargement des citernes se fait par une ouverture à couvercle située sur le dessus. Elles peuvent être vidées par le dessus ou le dessous, par deux types d’ouvertures conçues à cette fin et munies de valves. Pour des raisons de sécurité, au moins deux personnes seront présentes pendant la vidange et il sera interdit en tout temps de fumer ou d'utiliser d'autres sources d'ignition à proximité des camions-citernes.

La manutention de l’acide sulfurique fera également l’objet de précautions particulières. Ainsi, des douches d'urgence et des douches oculaires seront localisées à proximité de chaque point de manutention.

En général, l’acide sulfurique est entreposé dans des réservoirs en acier de carbone, dont l’épaisseur de la paroi est calculée en tenant compte de la corrosion potentielle et de la forte densité de l’acide. Un programme d’inspection interne incluant le nettoyage régulier des réservoirs contenant de l’acide sera établi afin notamment de détecter la corrosion. Les réservoirs seront situés dans un bassin de retenue ayant une capacité minimale de 120 % du réservoir le plus volumineux. En cas de fuite, l’acide sera neutralisé et pompé avant qu’il n’atteigne un égout ou un cours d’eau. D’autre part, en réagissant avec les parois des réservoirs, l’acide sulfurique dégage de l’hydrogène, ce qui fait monter la pression et génère des risques d’explosion en présence d’une source d’ignition. Ainsi, les réservoirs seront munis d’évents et des détecteurs d’hydrogène seront installés sur les sites d’entreposage. Il faut également utiliser des outils et des lampes antiétincelles sur ces sites et éviter les flammes ou le soudage. D’autres dispositions particulières encadrant l’entreposage de l’acide sulfurique seront respectées dans le cadre du projet, notamment en regard de la tuyauterie reliée aux réservoirs et de certains produits inflammables ne pouvant être entreposés à proximité de l’acide sulfurique.

Seul le personnel portant les vêtements de protection requis et ayant reçu une formation appropriée sur la manutention de ce produit et sur les mesures de sécurité encadrant cette activité sera autorisé à manipuler l’acide sulfurique. En plus des directives de sécurité prescrites par le fournisseur, les règlements gouvernementaux applicables en matière de transport et d’entreposage de matières dangereuses seront également respectés. Les dispositions applicables au transport de l’acide sulfurique seront également respectées lorsque les camions-citernes vidés de leur contenu reprendront la route, puisqu’ils pourraient alors transporter une quantité résiduelle d’acide.

2.2.4 **Selon la directive l'ÉIE devra fournir un aperçu du plan de désaffectation et de restauration pour toute composante associée au projet.**

Le promoteur doit fournir l'information sur la désaffection des systèmes de traitement des eaux usées et des réservoirs pétroliers dans la phase de restauration.

Réponse :

Au moment d'écrire ces lignes, une première version préliminaire du plan de restauration a été élaborée par SRK Consulting Inc. (2012). Le texte qui suit présente le détail des activités de restauration au sujet de la désaffectation des systèmes de traitement des eaux usées et des réservoirs pétroliers.

Désaffectation des systèmes de traitement des eaux usées

L'usine de traitement des eaux devra être opérée en postfermeture tant et aussi longtemps qu'elle sera requise pour rencontrer les normes de qualité de l'eau. Une fois que le programme de suivi aura démontré que la qualité de l'eau dans la fosse et les autres sources de ruissellement sont conformes aux normes, l'usine de traitement pourra être démantelée. Les bassins de sédimentation seront comblés ou reprofilés au besoin. Les bâtiments seront démantelés et les débris seront disposés de manière appropriée. Toutes les fondations seront enterrées et l'empreinte sera recouverte de sol récupéré lors des travaux de décapage (dépôts meubles), puis revégétée.

Les pompes, tuyauterie et autres installations ou fournitures seront soit récupérées, soit disposées dans un site de matières résiduelles conformément à la règlementation en vigueur.

La désaffectation des systèmes de traitement des eaux usées pourra s'amorcer seulement à partir de l'an 34 ou plus tard.

Réservoirs pétroliers

Les équipements et fournitures réutilisables de l'installation des réservoirs pétroliers seront récupérés avant le démantèlement. Ils seront préparés pour être expédiés vers des lieux de recyclage ou vers un point de vente.

Tous les équipements d'entreposage et de pompage seront préalablement vidés, puis démantelés. Les réservoirs souterrains seront lavés pour ensuite être excavés puis retirés. La membrane de l'aire de confinement secondaire des réservoirs de surface sera lavée et coupée en morceaux pour faciliter sa manutention.

Les réservoirs non récupérables et les équipements stationnaires seront retirés et disposés de façon appropriée selon la règlementation en vigueur.

L'empreinte et les sols de l'aire d'entreposage de carburant feront l'objet d'un programme de caractérisation pour mesurer les concentrations en produits pétroliers (phases I, II et III, si requis). En cas de contamination du site, des méthodes de restauration adaptées seront mises en place. Dans un tel cas, un traitement in situ des sols sera favorisé lorsque possible. Dans l'impossibilité, les sols seront excavés et envoyés vers un site de traitement autorisé. L'excavation serait ensuite comblée au moyen de roches stériles ou de dépôts meubles pour prévenir son remplissage et l'érosion.

Les critères qui seront employés pour évaluer la nécessité de décontaminer les sols sont ceux de la Politique de protection des sols et de réhabilitation des terrains contaminés du ministère du Développement durable, de l'Environnement, de la Faune et des Parcs du Québec (MDDEFP, 2002).

En absence de contamination, les installations seront démantelées une fois les réservoirs vidés de leur contenu. Toutes les fondations de béton sous le niveau du sol seront retirées. Toutes les dépressions laissées par les travaux seront comblées au moyen de roches stériles ou de dépôts meubles. L'empreinte sera ensuite reprofilée pour favoriser son drainage, puis scarifiée et revégétée. Lorsque nécessaire, l'empreinte sera recouverte d'une couche de sol récupérée lors des travaux de décapage (dépôts meubles) et revégétée pour prévenir l'érosion.

Les activités de restauration des réservoirs pétroliers seront réalisées à la fin de la vie de la mine, à partir de l'an 34.

Référence

SRK Consulting Inc. 2012. *Mining Site Closure and Rehabilitation Plan – Dumont Project. Draft - Version 2 (December 2012)*. Prepared for Royal Nickel Corporation. 16 p. et figures.

Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs du Québec (MDDEFP). 2002. *Politique de protection des sols et de réhabilitation des terrains contaminés*. Site Internet consulté le 25 mars 2013. Disponible [en ligne] : http://www.mddep.gouv.qc.ca/sol/terrains/politique/

2.3.2 Selon la directive, il est de la responsabilité du promoteur de fournir des données et des analyses suffisantes de tout effet potentiel du projet sur l'environnement pour permettre à l'Agence canadienne d'évaluation environnementale (l'Agence), aux ministères experts et de réglementation, aux groupes autochtones et au public d'en faire une évaluation adéquate.

Le promoteur devra fournir les documents suivants :

UQAT et Université Laval. Résultats préliminaires concernant le comportement géochimique des résidus serpentinifères du gisement Dumont (drainage minier acide). Sous la direction de Bruno Bussière. (réf. Avis de projet (décembre 2011, p.34).

Étude hydrogéologique préliminaire. Propriété minière de Dumont Mars 2010. Rapport réalisé pour Royal Nickel Corporation. 37 p. et annexes.

AUSENCO. 2011. Rapport technique sur l'étude de préfaisabilité du projet Dumont.

Genivar. 2008. Baseline environmental testing on ore, waste and tailings. Draft report on geochemical results. Dumont Project. Rapport de GENIVAR inc. pour Royal Nickel Corporation.

Genivar, 2009. Projet minier Dumont Nickel. Étude préliminaire de caractérisation environnementale, phase II. Rapport de Genivar pour Royal Nickel Corporation. 81 p. et annexes.

Golder Associés Ltée, Caractérisation géochimique des stériles et résidus miniers, Projet Dumont. Rapport Intérimaire, Novembre 2012.

Golder Associés Limitée. (GOLDER). 2012. Phase 2 du programme de caractérisation géochimique. Projet Dumont. Aout 2012. Rapport Confidentiel. 36 p. et ann.

GOLDER & ASSOCIATES. 2011. Static testing for waste rock and tailings, Dumont Nickel Project, Royal Nickel Corporation. Rapport de Golder pour Royal Nickel. Juillet 2011. Rapport no 10-1227-0028/2000. 26 p. + carte, figure et annexes.

SRK CONSULTING (CANADA) INC. (SRK) 2012a. GoldSim Water Balance for the Dumont Nickel Project Update. Memo – Draft. Novembre 2012. 14 pages et annexes.

SRK CONSULTING (CANADA) INC. (SRK). 2012b. *Flow Measurement Augmentation Study. Memo*. 6 p., tableaux et figures.

SRK CONSULTING (CANADA) INC. (SRK). 2012c. Dumont Nickel Project3D Groundwater Model. Août 2012.

SRK CONSULTING (CANADA) INC. (SRK). 2012d. Courriel avec 7 dessins attachés, de Cam Scott, SRK. 30 août 2012.

SRK CONSULTING (CANADA) INC. (SRK). 2011a. *Geotechnical and Hydrological Data in Support of Dumont Pre-feasibility Study; report 2CRO12.001*. 1 228 p.

SRK CONSULTING (CANADA) INC. (SRK). 2011b. *Hydrogeological Assessment for Dumont Pre-feasability Study*. Royal Nickel Corporation. Report 2CR012-001. Draft.

SRK CONSULTING (CANADA) INC. (SRK). 2011c. *Dumont 3D Groundwater Model: Conceptual Model*. Présentation pour Royal Nickel Corporation (RNC). 19 p.

Selon la directive, dans la zone d'étude, le promoteur décrira, sans s'y limiter, les composantes suivantes du milieu physique :

- **Changements climatiques**

Le promoteur doit fournir une description des changements climatiques (tendances).

Réponse :

La liste des références demandées a été transmise à l'ACÉE le 30 janvier 2013.

Le consortium Ouranos, dans son rapport intitulé « Savoir s'adapter aux changements climatiques » (2010), a étudié et rapporté les changements climatiques anticipés pour différentes régions du Québec jusqu'à l'horizon 2050. Les changements graduels anticipés pour le Québec sont :

- une augmentation des températures moyennes avec une hausse plus significative pour la température moyenne hivernale que pour celle prévalant durant l'été;
- une augmentation appréciable des précipitations hivernales pour plusieurs secteurs du Québec et des augmentations plus modestes ou non significatives sont attendues durant l'été;
- une plus grande variation des extrêmes de température, entraînant notamment une augmentation du nombre de cycles de gel-dégel;
- une augmentation du nombre d'évènements précipitations intenses.

Pour la région centre, dans laquelle est compris le projet Dumont, on anticipe des augmentations de température allant jusqu'à 4,9 °C durant l'hiver en 2050, alors que le volume des précipitations pourrait s'accroître de 12 à 22,9 % (tableau 3).

Tableau 3 Changement climatique anticipé pour la région centre du Québec à l'horizon 2050.

Saison	Température de l'air (°C)	Précipitations (%)
Hiver	3,5 à 4,9	12,0 à 22,9
Printemps	1,8 à 3,0	7,0 à 14,3
Été	1,8 à 3,0	1,1 à 6,9
Automne	2,1 à 3,2	4,5 à 13,1

Source : Ouranos (2010).

Référence

Ouranos. 2010. *Savoir s'adapter aux changements climatiques*. Montréal. 128 p.

2.3.4 **Selon la directive, pour la description du milieu humain, le promoteur doit s'assurer que le niveau d'information présentée permet l'évaluation des impacts du projet sur les gens et les collectivités dans la zone d'étude.**

Le promoteur devra fournir une carte illustrant les zones du Plan d'affection du territoire public (PATP) qui recoupe la zone d'étude et les installations du complexe minier.

Selon la directive, l'ÉIE doit, sans s'y limiter :

- **documenter l'utilisation privée et industrielle de l'eau souterraine.**

Le promoteur devra fournir des renseignements détaillés, car le niveau d'information présentée ne permet pas l'évaluation des impacts du projet sur les gens et les collectivités dans la zone d'étude.

Réponse :

La direction de l'Abitibi-Témiscamingue du ministère des Ressources naturelles du Québec (MRN) a finalisé l'élaboration du nouveau *Plan d'affectation du territoire public* (PATP) pour la région suite à des consultations publiques qu'elle a tenues en 2010. le plan d'affectation de l'Abitibi-Témiscamingue a été approuvé le 23 mai 2012. La zone d'étude recoupe cinq zones d'affectation du nouveau PATP dont les vocations permettent une utilisation multiple modulée ou de protection (voir carte à l'annexe 2) (MRNF, 2012).

La vocation multiple modulée est la plus courante en région et se caractérise par l'utilisation polyvalente du territoire et des ressources où aucune activité n'a préséance sur une autre. La mise en valeur des terres et des ressources est effectuée dans une optique de gestion intégrée. Les activités sont modulées par une intention gouvernementale et des objectifs spécifiques. Dans la zone d'étude, les secteurs sud-ouest (esker de Launay) et nord-est (esker Saint-Mathieu-Berry) sont modulés par un objectif spécifique d'adaptation des pratiques de gestion des ressources et du territoire afin de protéger la qualité de l'eau souterraine pour sa mise en valeur éventuelle à des fins de consommation humaine (commerciales ou municipales). Le secteur nord (zone de Guyenne) est modulé par deux objectifs spécifiques de gestion du territoire et des ressources (autres que minières) :

- intégrer le risque de dérangement associé à la possibilité de mise en valeur du potentiel minier (exploration et exploitation) en s'assurant d'informer et de sensibiliser les utilisateurs et les promoteurs éventuels;

- adapter les pratiques de gestion des ressources et du territoire de manière à assurer la protection du patrimoine archéologique.

En ce sens, les différents intervenants du milieu (entreprises minières et autres, ministères, municipalités, etc.) doivent informer les utilisateurs potentiels ou futurs (p. ex. un projet de développement domiciliaire) du potentiel minier d'un secteur afin de réduire les conflits d'utilisation du territoire public. Enfin, le secteur sud (Zone Amos) est également modulé par un objectif de protection du patrimoine archéologique.

La vocation de protection se définit par l'intention gouvernementale de sauvegarder des éléments du patrimoine naturel ou culturel (divers types d'habitats fauniques ou refuges biologiques). La mise en valeur des terres et des ressources est associée à des mesures particulières établies pour encadrer les activités pouvant s'y exercer. Le secteur du lac à la Savane (habitat faunique) est modulé par un objectif de sauvegarde de l'habitat du rat musqué.

Il n'y a aucune utilisation de l'eau souterraine, en amont de la route 111, à l'emplacement projeté pour les infrastructures minières. De part et d'autre de la route 111, elle est utilisée à des fins d'alimentation en eau potable puisque aucun réseau d'aqueduc ne dessert ces propriétés. Chacune des propriétés situées le long de la route 111 en aval hydraulique du projet (soit autour d'une vingtaine), tout comme dans les noyaux urbains de Launay et de Villemontel, s'alimente en eau potable à partir de puits captant l'eau de surface ou l'eau souterraine.

Les usages communautaires, dont l'école Ste-Thérèse (Launay) et l'école Morency (Villemontel), sont également assurés par des puits d'alimentation. Par ailleurs, aucune industrie n'est présente dans la zone d'étude locale du projet.

Un recensement plus précis des sources d'alimentation en eau potable est prévu en 2013.

Référence

MINISTÈRE DES RESSOURCES NATURELLES ET DE LA FAUNE (MRNF), 2012. *Plan d'affectation du territoire public – Abitibi-Témiscamingue*, 69 pages et annexes.

2.4.1 Selon la directive, les effets potentiels de toutes les composantes du projet doivent être documentés. Le promoteur doit indiquer les effets du projet touchant la construction, l'exploitation, l'entretien, les modifications prévisibles et, le cas échéant, la fermeture, la désaffectation et la restauration des sites et des installations associées au projet, et décrire ces effets en utilisant des critères appropriés.

Dans la modélisation de la dispersion atmosphérique, trois scénarios ont été considérés afin d'évaluer les impacts de la mine sur la qualité de l'air durant la phase d'exploitation, mais aucun scénario n'a été envisagé pour les durées de construction de la mine et de pré-production.

Le promoteur devrait inclure les impacts liés à ces deux phases du cycle de vie de la mine, d'autant plus que les émissions de particules durant cette phase du projet devraient être significatives. Autrement, le promoteur devrait justifier et expliquer en détail pourquoi les activités de construction et de pré-production n'ont pas été prises en compte dans l'étude.

Selon la directive, le promoteur devra spécifiquement évaluer les effets directs et indirects des modifications hydrologiques souterraines et de surface sur les eskers, plans d'eau et les milieux humides.

Les patrons d'écoulement des eaux de surface seront modifiés. L'étude d'impact indique que le rabattement de la nappe phréatique pourrait être de 1 à 5 m près du site.

Le promoteur doit évaluer les impacts de ces modifications sur la végétation et les milieux humides.

Réponse :

<u>Modélisation atmosphérique durant la construction</u>

Selon les données actuellement disponibles, c'est à l'année -1 que les émissions de particules devraient être les plus significatives pour la phase de construction/préproduction. En effet, le décapage de dépôts meubles sera plus intensif lors de cette année qu'à l'année -2, avec 9,7 Mt. De plus, une extraction de 28,5 Mt de roches (minerai et roches stériles) sera également effectuée lors de cette année, le tonnage total de roches et de dépôts meubles extrait de la fosse à l'année -1 étant d'environ 44,2 Mt.

En comparaison, le scénario de l’année 2 qui a été modélisé aura une intensité de décapage de dépôts meubles beaucoup plus importante avec 28,4 Mt. De plus, l’extraction de 33,3 Mt de roches pour alimenter à pleine capacité la première ligne du concentrateur et pour la construction des digues sera également plus significative à l’année 2 qu’à l’année -1.

Dans ce contexte, sachant que la teneur en particules fines des dépôts meubles est relativement élevée et considérant que les activités d’extraction seront effectuées relativement en surface dans les deux cas, le plus faible tonnage à l’année -1 justifie de ne pas avoir modélisé cette année. En fait, seulement les émissions provenant des activités de construction du concentrateur et des infrastructures connexes (garage, entreposage de carburants, unité d’assemblage d’explosifs et bâtiment administratif) seront plus intensives à l’année -1.

Cependant, il est important de rappeler que le programme de suivi des poussières sera déjà mis en place dès le début de la phase de construction/préproduction afin de vérifier le respect des normes en vigueur et l’efficacité des mesures d’atténuation. Or, dans l’éventualité où le programme de suivi démontrerait un dépassement des normes, RNC pourra ajuster ses activités de construction lors de conditions de dispersion défavorables. En effet, puisque les sources de poussières provenant de ces activités seront localisées et de courtes durées, la possibilité de moduler efficacement ces dernières permettra de s’assurer du respect des normes.

Impact du rabattement de la nappe phréatique sur la végétation et sur les milieux humides

La zone d’étude est entièrement située à l’intérieur de la zone d’argile, vestige postglaciaire de la présence des lacs pro-glaciaires Barlow et Ojibway entre 10 000 et 7 000 AA. Les sols de la zone d’argile se caractérisent évidemment par un mauvais drainage naturel, auquel contribue la topographie généralement plane de la région. La végétation de la zone d’étude est donc fortement influencée par la topographie et les sols imperméables. Les tourbières (ouvertes ou boisées), les marécages, les marais et les étangs occupent la plus grande partie de la zone d’étude puisque les eaux de surfaces ne s’infiltrent que très lentement dans les sols.

Il est actuellement prévu d’évacuer entre 2 800 et 5 500 m^3 d’eau souterraine accumulée dans la fosse chaque jour. Ce pompage, ainsi que le cône de rabattement de la nappe phréatique qu’il occasionnera au fil des ans, n’affectera pas significativement l’intégrité des milieux humides de la zone d’étude. D’une part, les sols y sont imperméables (sols argileux) ou possèdent une capacité élevée de rétention de l'eau (sols organiques), ce qui signifie que l'eau de surface (les précipitations) percole très lentement dans le sous-sol. Tel que décrit à la section 6.2.6.1 et montré sur la carte 6-4, un horizon de dépôts glaciolacustres couvre la presque totalité de la zone d'étude. Cet horizon est caractérisé par la présence de silt et d'argile, ce qui limite grandement sa conductivité hydraulique, laquelle varie entre $1,16 \times 10^{-8}$ m/s et $3,59 \times 10^{-6}$ m/s. Pour la même raison, l'échantillonnage et l'analyse des sédiments des lacs Villemontel et à la Savane et un tronçon de la rivière Villemontel (section 7.5.6.2) montrent qu'il n'y a pas de lien hydraulique entre les eaux souterraines et de surface.

D'autre part, les précipitations totales annuelles varient entre 900 et 1 000 mm par année, ce qui signifie que la zone d'étude (près de 91 km^2) reçoit entre 82 et 91 millions de mètres cubes d'eau par année. Pour évacuer toute cette eau, il faudrait pomper entre 225 000 et 250 000 m^3 par jour. Au rythme des précipitations, les sols devraient en principe rester suffisamment humides.

Néanmoins, pour valider cette hypothèse, un suivi du niveau d'eau dans le complexe de milieux humides autour du lac à la Savane, au moyen de pointes filtrantes, sera instauré à partir de l'an 1 d'exploitation. Ce suivi sera ensuite réalisé annuellement, sur la base de trois mesures de niveau par année, et ce, jusqu'à la fin de la vie de la mine à l'an 34.

2.4.6 Selon la directive, les risques environnementaux qui peuvent influencer le projet seront décrits, leurs effets potentiels documentés ainsi que la façon dont ils ont été pris en compte dans la conception du projet

En plus des risques environnementaux déjà décrits dans l'étude environnementale, le promoteur doit décrire comment il a tenu compte des tendances des changements climatiques (voir notre demande concernant la section 2.3.2 des lignes directrices et établir les liens avec le plan de gestion des eaux (section 5.6 de l'étude d'impact).

Réponse :

Outre les prédictions de Ouranos présentées précédemment, deux sites internet canadiens (Pacific Climate Impacts Consortium – PCIC et le Canadian Climate Change Scenarios Network – CCCSN) proposent des données sur les changements climatiques. Les prédictions de ces modèles prévoient une augmentation des précipitations annuelles de l'ordre de 10 (+ 1,2 %) à 160 mm (+ 18,3 %) pour la période comprise entre 2020 et 2080. Cela implique non seulement une augmentation du volume des précipitations annuelles, mais aussi dans leur distribution saisonnière. Dans le contexte du projet Dumont, ces changements pourront avoir des impacts bénéfiques ou non. Une analyse de sensibilité sera réalisée au moment de l'ingénierie de détails du projet Dumont pour adresser adéquatement la question des changements climatiques dans la gestion de l'eau. Lorsque requis, des mesures de contingence additionnelles seront prévues pour être en mesure de gérer de plus grands volumes d'eau de façon adaptative au moyen d'un système de suivi des débits, des niveaux et des volumes d'eau sur le site minier.

Tel que précisé à la section 5.6.2.2 du volume 1 de l'EIES, les infrastructures de contrôle de l'eau sont conçues pour absorber une précipitation de 24 h de récurrence 1 : 1 000 ans. Les changements climatiques auront certes une influence sur la gestion des débits au quotidien, mais ceux-ci demeureront toujours bien en deçà des débits de conception (p. ex. volume des puisards, capacité des canaux, des pompes, etc.). En cas de crue extrême, la fosse pourrait être utilisée pour y dévier des surplus d'eau, et ce, sans que cela n'affecte les opérations du concentrateur, car le minerai de faible teneur accumulé en surface pourrait, dans un tel cas, être utilisé durant la période où la fosse serait partiellement noyée.

2.4.8 Selon la directive des effets cumulatifs peuvent survenir si la mise en œuvre du projet à l'étude a causé des effets négatifs résiduels directs sur les composantes environnementales, en tenant compte de l'application des mesures d'atténuation et si ces composantes de l'environnement sont touchées par d'autres activités ou projets passés, en cours ou futurs (dont la probabilité de réalisation est grande).

Un des enjeux identifiés dans le cadre de l'analyse des impacts est l'effet du projet sur la qualité de l'air. Cette composante n'a pas été retenue par le promoteur pour l'analyse des effets cumulatifs bien qu'elle ait été identifiée comme un enjeu régional. Le promoteur doit procéder à cette analyse ou justifier pourquoi elle n'est pas nécessaire.

Réponse :

Les modélisations de la dispersion atmosphérique des poussières montrent que les activités minières vont surtout affecter le site minier, mais que leur influence est très limitée à l'extérieur de ce dernier et au-dessus des secteurs habités comme les villages de Launay et Villemontel.

En périphérie du site minier, on ne retrouve aucune activité industrielle, outre des travaux d'aménagement forestiers répartis dans le temps et dans l'espace. Les deux principales activités susceptibles d'occasionner un effet cumulatif avec les activités minières projetées sur la qualité de l'air sont le chauffage résidentiel au bois et les transports locaux. Or, avec une très faible densité d'occupation du territoire en périphérie du site minier, ces activités n'ont que très peu d'influence sur la qualité de l'air de la région.

D'ailleurs, selon les statistiques régionales du MDDEFP, l'indice de la qualité de l'air de l'Abitibi montre une qualité de l'air bonne ou acceptable la très grande majorité du temps, des évènements de mauvaise qualité étant très rares (www.mddep.gouv.qc.ca/air/iqa/statistiques/region.htm). Cet indice cumule des données sur l'ozone, les particules de fin diamètre (2,5 µm), le dioxyde de soufre, le dioxyde d'azote et le monoxyde de carbone.

Pour l'ensemble de ces raisons, il n'a pas été jugé pertinent de traiter les impacts cumulatifs associés aux émissions atmosphériques de polluants attribuables au projet Dumont.

2.6.2 Selon la directive, le promoteur doit veiller à consulter et à impliquer les peuples autochtones susceptibles d'être touchés par le projet. À cet effet, l'ÉIE devra notamment contenir :

- **un résumé de l'analyse du promoteur concernant son choix des communautés à consulter;**

Le promoteur doit fournir cette analyse.

Réponse :

Le projet Dumont est localisé sur le territoire municipal des localités de Launay et Trécesson. L'ensemble des infrastructures du projet est situé dans le bassin versant de la rivière Villemontel, dans le bassin hydrographique du Saint-Laurent. Selon notre compréhension, le territoire localisé au nord du projet dans le bassin versant de la rivière Harricana, dans le bassin hydrographique de la Baie James, fait partie du territoire régi par la Convention de la Baie-James et du Nord québécois (CBJNQ). Le projet Dumont est cependant situé dans un territoire qui n'est pas régi par la CBJNQ. Selon notre analyse, le processus d'évaluation environnementale défini au chapitre 22 de la CBJNQ intitulé « L'environnement et le développement futur au sud du 55^{e} parallèle » ne s'applique pas au site minier du projet Dumont.

RNC est très soucieuse des relations qu'elle entretient avec les communautés locales, allochtones et autochtones. En l'absence de revendications territoriales formelles et claires couvrant le secteur du projet Dumont, ainsi qu'en l'absence de communauté autochtone constituée en réserve ou en établissement indien au site minier, RNC a cherché à établir l'utilisation actuelle des terres et des ressources de la zone d'étude locale élargie du projet Dumont, à des fins traditionnelles, par des membres de communautés autochtones. Il appert que la communauté autochtone localisée la plus près du projet est celle de Pikogan (Première Nation Abitibiwinni, membre du Conseil tribal de la Nation algonquine Anishinabeg), qui est située à environ 25 km à l'est du projet.

C'est dans ce contexte que RNC a débuté un dialogue constructif avec la communauté de Pikogan dès 2007, au tout début de ses travaux d'exploration de la propriété Dumont. Au cours de rencontres avec des représentants de la Première Nation algonquine Abitibiwinni, RNC a recueilli de l'information sur l'utilisation du territoire par les membres de la communauté et ces derniers ont transmis une carte dont une copie est jointe. La relation établie par RNC avec Pikogan a permis de constater que les membres de la famille Mapachee de cette communauté, utilisant les pourtours du lac Chicobi localisé au nord du projet Dumont, sont les plus susceptibles d'être touchés par le développement du projet Dumont.

Au cours du processus d'analyse et désirant consulter et impliquer les autochtones susceptibles d'être touchés par le projet, RNC a aussi communiqué avec le Secrétariat aux Affaires autochtones qui les a encouragé à continuer leur relation avec la Première Nation Abitibiwinni.

2.8 Selon la directive, le promoteur devra décrire les activités de surveillance à toutes les étapes du projet, l'engagement du promoteur à les mettre en œuvre et les ressources prévues à cette fin.

Dans la section 9.2, le promoteur fait référence à une réunion de chantier qui aura lieu au tout début des travaux et à la surveillance des chantiers. Le promoteur doit définir ce qu'il entend par chantier. S'agit-il de la phase uniquement de la phase construction/préproduction ?

Le promoteur doit décrire les activités de surveillance pour toutes les étapes du projet.

Réponse :

Dans le contexte du projet Dumont, la notion de chantier réfère à une aire de travail faisant intervenir de la machinerie lourde pour des travaux de construction, de réparation ou de démolition. Sur toute la durée de vie du projet Dumont, incluant les phases de construction/préproduction, exploitation et restauration, il y aura plusieurs chantiers qui se succèderont dans le temps et dans l'espace.

Conformément à sa Politique environnementale, RNC, à l'intérieur de ses activités, voit « à mettre en place un cadre visant à mesurer le rendement environnemental de ses activités, en veillant à ce que la Société et son personnel respectent tous les règlements et les engagements environnementaux connus et applicables ». RNC réitère cet engagement et cette approche sera étendue à tous les entrepreneurs et fournisseurs de services lors de la réalisation du projet Dumont. Pour y arriver, RNC imposera un cadre strict pour la surveillance environnementale et s'assurera de prévoir des moyens financiers adéquats pour la surveillance de chantiers.

Au stade de la préfaisabilité, les activités génériques de surveillance, décrites sommairement à la section 9.2 du volume 1 de l'EIES, comprennent le respect des mesures d'atténuation ainsi que des normes et règlements en vigueur. La surveillance environnementale consistera, dans un premier temps, à s'assurer que toutes les demandes d'autorisation et de permis nécessaires à la réalisation des travaux de chantier aient été effectuées et que tous les certificats d'autorisation et permis aient été reçus préalablement au début des travaux. Ce type de surveillance s'effectuera en grande partie à l'étape d'avant-projet.

Tous les chantiers seront encadrés par des plans, devis et/ou documents contractuels dans lesquels seront intégrées des exigences générales et spécifiques en matière d'environnement. Tel que mentionné précédemment, les exigences générales en matière d'environnement correspondent aux engagements pris dans le cadre de l'EIES, aux obligations découlant de l'autorisation de réalisation du projet (décret) et aux politiques de RNC en matière d'environnement. Les exigences spécifiques sont propres aux types de travaux réalisés. Elles permettent le respect des autorisations environnementales délivrées ainsi que les lois et règlements applicables. Au moment d'écrire ces lignes, l'étude de faisabilité du projet Dumont n'était pas encore complétée, mais devrait être publiée dans le courant de l'été 2013. Ce document permettra d'évaluer précisément la nature et l'envergure des travaux requis pour la construction, l'exploitation et la restauration du projet Dumont. Ce n'est que sur la base de cette information (ingénierie de détails) que les mesures de surveillance spécifiques pourront être élaborées.

Lors des chantiers, des responsables de l'environnement seront présents aux sites des travaux afin de veiller, entre autres, à l'application des exigences générales et spécifiques en matière d'environnement.

À partir de l'étape de construction/préproduction, le volet environnemental des activités réalisées dans un cadre autre que celui des activités de chantier sera surveillé par du personnel de RNC présent au site. Cette équipe s'assurera que les méthodes d'exploitation respectent tous les permis et autorisations en vigueur, ainsi que les politiques internes en matière d'environnement de RNC.

Le détail des activités de surveillance est généralement exigé dans les conditions d'autorisation des projets. Il est donc préalablement soumis avant le début des premiers travaux de construction.

Selon la directive un programme de suivi est conçu pour vérifier l'exactitude de l'ÉE et déterminer l'efficacité des mesures mises en œuvre pour atténuer les effets environnementaux négatifs du projet. L'ÉIE doit décrire le programme de suivi proposé avec suffisamment de détails

Le promoteur prévoit des suivis au tableau 7-25 qui ne sont pas décrits à la section 9.3 pour les composantes suivantes :

- **régime hydrique et sédimentaire lors de la construction et de l'exploitation (apport de M.E.S. relié aux modifications du patron d'écoulement);**
- **compensation pour les pertes de milieux humides;**
- **compensation pour les pertes d'habitats aquatiques;**
- **compensation pour les pertes d'habitats fauniques (espèces à statut particulier-campagnol).**

Le promoteur doit fournir une description de ces suivis conformément à l'exigence de la section 2.8 des lignes directrices.

Réponse :

Le chapitre 9.3 dresse les grandes lignes des suivis, mais ne constitue pas le programme définitif de l'ensemble des suivis environnementaux dont une première version sera élaborée avant la fin de 2013. Ce programme comprendra :

- le régime hydrique et sédimentaire lors de la construction et de l'exploitation (apport de MES relié aux modifications du patron d'écoulement). Ce suivi sera inclus en partie dans le programme de surveillance lors des travaux de construction et lors du suivi de l'effluent et de la qualité de l'eau en phase d'exploitation;
- la compensation pour les pertes de milieux humides. Ce suivi sera élaboré une fois que le ou les projets de compensation auront été convenus avec le MDDEFP.
- la compensation pour les pertes d'habitats aquatiques. Ce suivi sera élaboré une fois que le ou les projets de compensation auront été convenus avec le MDDEFP et Pêches et Océans Canada (MPO). Il comprendra, notamment, le suivi de l'utilisation des nouveaux habitats par les poissons;
- la compensation pour les pertes d'habitats fauniques (espèces à statut particulier-campagnol). La première version du programme de suivis environnementaux comprendra le suivi de l'utilisation des aménagements rocheux qui seront réalisés dans le secteur du lac à la Savane et/ou à l'ouest du parc à résidus projetés. Ce suivi sera réalisé sur une période de trois ans, soit deux, quatre et six ans suivant la réalisation des aménagements;
- le suivi des niveaux d'eau au moyen d'un réseau de pointes filtrantes dans le complexe de milieu humide autour du lac à la Savane. Ce suivi sera réalisé sur une base annuelle, trois fois par année, jusqu'à l'an 34.

ANNEXE 1

Fiche signalétique des produits utilisés

teckcominco

SULFURIC ACID
MATERIAL SAFETY DATA SHEET

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product Identity: Sulfuric Acid (93 percent)

Manufacturer:
Teck Cominco Metals Ltd.
Trail Operations
Trail, British Columbia
V1R 4L8
Emergency Telephone: 250-364-4214

Supplier:
Teck Cominco American Incorporated
Industrial Chemicals
15918 East Euclid Avenue
P.O. Box 3087
Spokane, WA 99216-1815

MSDS Preparer:
Teck Cominco Metals Ltd.
600 - 200 Burrard Street
Vancouver, British Columbia
V6C 3L9

Date of Last Review/Edit: December 15, 2003.

Product Use: Used in the manufacturing of chlorine dioxide (a pulp and paper bleaching chemical), in the manufacturing of phosphate and sulphate fertilizers, in the manufacturing of metal sulfates, as a metal pickling chemical and as a component of lead storage batteries.

SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredient	Approximate Percent by Weight	C.A.S. Number	Occupational Exposure Limits (OELs)	LD$_{50}$ / LC$_{50}$ Species and Route
Sulfuric Acid	93	7664-93-9	OSHA PEL 1 mg/m^3	LD$_{50}$ orl-rat 2140 mg/kg
			ACGIH TLV 1 mg/m^3	LC$_{50}$ ihl-rat 510 mg/m^3/2H
			NIOSH REL 1 mg/m^3	LC$_{50}$ ihl-mouse 320 mg/m^3/2H

NOTE: OELs for individual jurisdictions may differ from OSHA PELs. Check with local authorities for the applicable OELs in your jurisdiction. OSHA - Occupational Safety and Health Administration; ACGIH - American Conference of Governmental Industrial Hygienists; NIOSH - National Institute for Occupational Safety and Health. OEL – Occupational Exposure Limit, PEL – Permissible Exposure Limit, TLV – Threshold Limit Value, REL – Recommended Exposure Limit.

Trade Names and Synonyms: Oil of vitriol, electrolyte acid, battery acid, matting acid, H_2SO_4.

SECTION 3. HAZARDS IDENTIFICATION

Emergency Overview: A strong mineral acid present as a colorless and odorless oily liquid when pure but may appear yellow to dark brown when impure. Extremely corrosive to all body tissues, causing rapid tissue destruction and serious chemical burns. Skin or eye contact requires immediate first aid. Can decompose at high temperatures forming toxic gases such as sulfur oxides. Non-flammable but reacts violently with water generating large amounts of heat with potential for spattering of the acid. Can react with combustible materials to generate heat and ignition. Reacts with most metals, particularly when diluted with water, to form flammable hydrogen gas which may create an explosion hazard. It is highly toxic to aquatic organisms and plant life.

Potential Health Effects: Sulfuric acid is not very volatile and workplace exposures are therefore primarily due to accidental splashes or to processes or actions that generate an acid mist. It is extremely corrosive to all body tissues, causing rapid tissue destruction and serious chemical burns on contact with the skin or eyes. Skin or eye contact requires immediate first aid. Inhalation of sulfuric acid mist or fumes may produce irritation of the nose, throat and respiratory tract. High levels of acid mist are also irritating to the skin and eyes. Chronic inhalation of acid mist may cause pitting and erosion of tooth enamel. Sulfuric acid is not listed as a carcinogen by OSHA, NTP, IARC, ACGIH or the EU. IARC, the ACGIH and the NTP have concluded there is sufficient evidence that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic or potentially carcinogenic to humans. (see Toxicological Information, Section 11)

Potential Ecological Effects: It is highly toxic to aquatic organisms and plant life but does not bioaccumulate or concentrate in the food chain. (see Ecological Information, Section 12)

EU Risk Phrase: R35 - Causes severe burns.

SECTION 4. FIRST AID MEASURES

Eye Contact: Immediately flush with warm, running water, including under the eyelids, for at least 15 minutes. Seek medical attention immediately. Flushing must begin immediately if permanent eye tissue damage is to be avoided.

Skin Contact: Immediately remove contaminated clothing and footwear under shower and thoroughly flush affected area. Seek immediate medical attention. Discard contaminated clothing, shoes and leather goods (e.g. watch bands, belts, etc.).

Inhalation: Remove victim from exposure area to fresh air immediately. If breathing has stopped, give artificial respiration. Medical oxygen may be administered, if available, where breathing is difficult. Seek medical attention immediately.

Ingestion: If victim is conscious and can swallow, dilute stomach contents with 2 to 4 cupfuls of water or milk. Do not induce vomiting. Seek medical attention immediately and bring a copy of this MSDS. Never give anything by mouth to an unconscious person.

SECTION 5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Sulfuric acid is not flammable or combustible. However, fires may result from the heat generated by contact of concentrated sulfuric acid with combustible materials. Sulfuric acid reacts with most metals, especially when diluted with water, to produce hydrogen gas which can accumulate to explosive concentrations inside confined spaces. It reacts violently with water and organic materials evolving a considerable amount of heat and is very hazardous when in contact with carbides, cyanides, and sulfides.

Extinguishing Media: Use dry chemical or carbon dioxide extinguishers. Use water spray to cool fire-exposed containers. Use water only if absolutely necessary and DO NOT USE WATER DIRECTLY ON ACID as a violent reaction may occur resulting in spattering of the acid.

Fire Fighting: Fire fighters must be fully trained and wear full protective clothing including an approved, self-contained breathing apparatus which supplies a positive air pressure within a full face-piece mask. For fires close to a spill or where vapors are present, use acid-resistant personal protective equipment.

Flashpoint and Method: Not Applicable.

Upper and Lower Flammable Limit: Not Applicable.

Autoignition Temperature: Not Applicable.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Procedures for Cleanup: Control source of release if possible to do safely. Contain spill, isolate hazard area, and deny entry to unauthorized personnel. Dike area around spill and pump uncontaminated acid back to process if possible. Neutralize spilled material with alkali such as sodium carbonate or sodium bicarbonate, soda ash, lime or limestone granules. If neutralized with lime rock or soda ash, good ventilation is required during neutralization because of the release of carbon dioxide gas. Allow to stand for 1-2 hours to complete neutralization, then absorb any liquid in solid absorbent such as vermiculite or clay absorbents. Place spilled material in suitable labeled containers for final disposal. Treat or dispose of waste spilled material and/or contaminated absorbent material in accordance with all local, regional and national regulations.

Personal Precautions: Acid resistant protective clothing and gloves. Sleeves and pant legs should be worn outside, not tucked into gloves and rubber boots. Use close-fitting safety goggles or a combination of safety goggles and a face shield where splashing is a possibility. Respiratory protection equipment should be worn where exposure to hazardous levels of mist or fume is possible.

Environmental Precautions: This product can pose a threat to the environment. Contamination of soil and water should be prevented. Keep spillage from entering ground, streams or sewers.

SECTION 7. HANDLING AND STORAGE

Store in a dry, cool, well-ventilated area away from incompatible substances. Keep in tightly closed containers which are appropriately labeled. Do not allow contact with water. Do not store near alkaline substances. Always practice good personal hygiene. Refrain from eating, drinking, or smoking in work areas. Thoroughly wash hands before eating, drinking, or smoking.

EU Safety Phrase(s): S26 - in case of contact with eyes, rinse immediately with plenty of water and seek medical advice; S30 - never add water to this product; S45 – In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Protective Clothing: Protective clothing and gloves as well as glasses, goggles or face shield. Appropriate protective clothing should be worn where any possibility exists that skin contact can occur. Use close-fitting safety goggles or a combination of safety goggles and a face shield where any possibility exists that eye contact can occur. An eyewash and quick drench should be provided. Workers should wash immediately when skin becomes contaminated and at the end of each work shift.

Ventilation: Use adequate local or general ventilation to maintain the concentration of sulfuric acid aerosol mists below recommended occupational exposure limits.

Respiratory Protection: Where sulfuric acid mists are generated and cannot be controlled to within acceptable levels, use appropriate NIOSH-approved respiratory protection equipment (a combination of a 42CFR84 Class N, R or P-100 particulate filter and an acid gas cartridge). Note: sulfuric acid mist also causes eye irritation at high concentrations and a full face respirator or supplied air respirator may be necessary in some cases.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear, Colorless, Oily Liquid	**Odor:** Odorless when cold	**Physical State:** Liquid	**pH:** Concentration dependant <0.1 (93% Sol'n), 0.3 (5% or 1N Sol'n)
Vapor Pressure: <0.04 kPa (<0.3 mm Hg) @ 25ºC	**Vapor Density:** 3.4 (air = 1)	**Boiling Point/Range:** 280°C	**Freezing/Melting Point/Range:** -35°C
Specific Gravity: 1.84	**Evaporation Rate:** Not Applicable	**Coefficient of Water/Oil Distribution:** No Data Available	**Odor Threshold:** > 1 mg/m³
Solubility in Water: Completely soluble with generation of heat			

SECTION 10. STABILITY AND REACTIVITY

Stability & Reactivity: Stable under normal temperatures and pressures. Decomposes at 340ºC into sulfur trioxide and water. Extremely reactive with metals, alkalis and many other organic and inorganic chemicals. Hazardous gases such as hydrogen cyanide, hydrogen sulfide and acetylene are evolved on contact with chemicals such as cyanides, sulfides and carbides. Contact with combustible organic matter may cause fire or explosion. Dilution with water generates excessive heat and spattering or boiling may occur. Always add acid to water, NEVER ADD WATER TO ACID.

Incompatibilities: Combustible materials, organic materials, oxidizers, amines, bases, water, excess heat, and metals.

Hazardous Decomposition Products: Sulfur dioxide, sulfur trioxide.

SECTION 11. TOXICOLOGICAL INFORMATION

General: Concentrated sulfuric acid exerts a strong corrosive action on all tissues due to its severe dehydration action (removing water from tissues). The severity of the chemical burn produced by the concentrated acid is proportional to the strength of the acid and the duration of contact. Burns are deep but typically not severely painful. Prolonged exposure to dilute solutions or acid mists may lead to irritation of the eyes and skin causing chronic conjunctivitis and dermatitis. Inhalation of sulfuric acid mist or fumes may result in irritation of the respiratory tract possibly leading to laryngeal spasm. Asthmatics may be more sensitive to inhaling sulfuric acid mists. IARC and the ACGIH have concluded there is sufficient evidence that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic or potentially carcinogenic to humans.

Acute:
Skin/Eye: Splashes can cause severe eye burns and may cause irreversible eye injury and possible blindness. Skin contact results in severe burns and may result in permanent scarring. High levels of sulfuric acid mists and aerosols are also irritating to the eyes and skin.

Inhalation: Inhalation may cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath, laryngeal spasm and delayed lung edema. These symptoms may be aggravated by physical exertion.

Ingestion: Ingestion is unlikely in industrial use but will result in severe burns to the mouth, throat, esophagus and stomach which could lead to permanent damage to the digestive tract. Small amounts of acid can also enter the lungs during ingestion or subsequent vomiting and cause serious lung injury.

Chronic: Prolonged exposure to dilute solutions or mists may result in eye irritation (chronic conjunctivitis) and produce skin dermatitis. Exposure to high concentrations of acid mist has caused erosion and discoloration of the anterior teeth. Sulfuric acid is not listed as a carcinogen by OSHA, National Toxicology Program (NTP), International Agency for Research on Cancer (IARC), ACGIH or the EU. IARC has concluded that there is sufficient evidence that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to humans, resulting in an increased incidence of primarily laryngeal cancers. The ACGIH lists strong inorganic acid mists containing sulfuric acid as a suspect human carcinogen (A2) and the NTP have recently re-classified strong inorganic acid mists containing sulfuric acid to a known human carcinogen. OSHA and the EU do not list sulfuric acid mist as a carcinogen.

SECTION 12. ECOLOGICAL INFORMATION

Sulfuric acid is very corrosive and is highly toxic to aquatic and terrestrial life at low concentrations.

SECTION 13. DISPOSAL CONSIDERATIONS

Do not wash down drain or allow to reach natural watercourses. Dispose of neutralized waste consistent with regulatory requirements. If neutralized with lime rock or soda ash, good ventilation is required during neutralization because of the release of carbon dioxide gas.

SECTION 14. TRANSPORT INFORMATION

Proper Shipping Name Transport Canada and U.S. DOT	Sulfuric Acid
Transport Canada and U.S. DOT Hazard Classification	Class 8, Packing Group II
Transport Canada and U.S. DOT Product Identification Number	UN1830
Marine Pollutant	No
IMO Classification	Class 8

SECTION 15. REGULATORY INFORMATION

U.S.

Listed on TSCA Inventory	Yes
Hazardous Under Hazard Communication Standard	Yes
CERCLA Section 103 Hazardous Substances	Sulfuric Acid Yes RQ: 1000 lbs. (454 kg.)
EPCRA Section 302 Extremely Hazardous Substance	Yes RQ: 1000 lbs. (454 kg.) Threshold Planning Quantity: 1000 lbs.
EPCRA Section 311/312 Hazard Categories	Immediate (Acute) Health Hazard - Corrosive Immediate (Acute) Health Hazard - Highly Toxic
EPCRA Section 313 Toxic Release Inventory	Sulfuric Acid CAS NO. 7664-93-9 Percent by Weight: 93

CANADIAN:

Listed on Domestic Substances List:	Yes
WHMIS Classification	Controlled Product, Classification D1A (Immediate & Serious Toxic Effects), E (Corrosive Material)

EUROPEAN UNION:

Listed on the European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
EU Classification:	Corrosive

SECTION 16. OTHER INFORMATION

The information in this Material Safety Data Sheet is based on the following references:

- American Conference of Governmental Industrial Hygienists, 1991, Documentation of the Threshold Limit Values and Biological Exposure Indices, 6th Edition plus updates.
- American Conference of Governmental Industrial Hygienists, 2002, Guide to Occupational Exposure Values.
- American Conference of Governmental Industrial Hygienists, 2003, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.
- Canadian Centre for Occupational Health & Safety CHEMINFO Record No. 122 - Sulfuric Acid, 2003-04.
- Commission de la santé et la sécurité du travail, Service du Répertoire toxicologique, Acide Sulfurique, 2000-03.
- European Economic Community, Commission Directives 91/155/EEC, 93/21/EEC, and 67/548/EEC.
- Industry Canada, Controlled Products Regulations SOR/88-66, as amended.
- International Chemical Safety Cards (WHO/IPCS/ILO), ICSC:0362 – Sulfuric Acid (Revised Oct 2000).
- Merck & Co., Inc., 2001, The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, Thirteenth Edition.
- National Library of Medicine, National Toxicology Information Program, 2003, Hazardous Substance Data Bank.
- Patty's Toxicology, Fifth Edition, 2001: E. Bingham, B. Cohrssen & C.H. Powell, Ed.
- Sax, N. Irving, 1989, Dangerous Properties of Industrial Materials, Seventh Edition.
- U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health. NIOSH Pocket Guide to Chemical Hazards. CD-ROM Edition DHHS (NIOSH) Publication No. 2001-145, August 2001.
- U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, Toxicological Profile for Sulfur Trioxide and Sulfuric Acid, December 1998.
- U.S. Occupational Safety and Health Administration, 1989, Code of Federal Regulations, Title 29, Part 1910.
- Urben, P.G., 1995, Bretherick's Handbook of Reactive Chemical Hazards, Fifth Edition.

Notice to Reader

Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. Teck Cominco American Incorporated extends no warranty and assumes no responsibility for the accuracy of the content and expressly disclaims all liability for reliance thereon. This material safety data sheet provides guidelines for the safe handling and processing of this product; it does not and cannot advise on all possible situations. Therefore, your specific use of this product should be evaluated to determine if additional precautions are required. Individuals exposed to this product should read and understand this information and be provided pertinent training prior to working with this product.

MSDS: 0011225
Print Date: 05/04/2010
Revision Date: 05/04/2010

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	**AERO® 3477 LA Promoter**
Product Description:	Dithiophosphate salt in water
Intended/Recommended Use:	Mining chemical

Supplied By: CYTEC CANADA INC., 9061 GARNER ROAD
NIAGARA FALLS, ONTARIO, CANADA L2E 6S5 1-905/356-9000

Manufactured By: CYTEC INDUSTRIES INC., FIVE GARRET MOUNTAIN PLAZA,
WOODLAND PARK, NEW JERSEY 07424, USA - 973/357-3100

EMERGENCY PHONE (24 hours/day) - For emergency involving spill, leak, fire, exposure or accident call:
Asia Pacific Region:
Australia - +61-3-9663-2130 or 1800-033-111
China (PRC) - +86(0)532-8388-9090 (NRCC)
New Guinea - +61-3-9663-2130
New Zealand - +61-3-9663-2130 or 0800-734-607
All Others - +65-633-44-177 (CareChem24 Singapore)
Canada: 1-905-356-8310 (Cytec Welland, Canada plant)
Europe/Africa/Middle East: +44-(0)208-762-8322 (CareChem24 UK)
Latin America:
Brazil - 0800 0111 767 (SOS Cotec)
Chile - +56-2-247-3600 (CITUC QUIMICO)
All Others - +52-376-73 74122 (Cytec Atequiza, Mexico plant)
USA: +1-703-527-3887 or 1-800-424-9300 (CHEMTREC)

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2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR:

Color:	amber-brown
Appearance:	liquid
Odor:	sulfur

STATEMENTS OF HAZARD:

DANGER!	CAUSES BURNS OF EYES AND SKIN

POTENTIAL HEALTH EFFECTS

EFFECTS OF EXPOSURE:

The acute oral (rat) LD50 and dermal (rabbit) LD50 values are estimated to be >2,000 mg/kg and >2,000 mg/kg, respectively. This material was corrosive (skin) in rabbits. Direct contact with this material may cause severe eye and skin irritation. Contact with acid may cause liberation of hydrogen sulfide. Hydrogen sulfide has a strong rotten-egg odor, however, some people are unable to smell the gas and exposure will deaden the sense of smell. Therefore, odor is an unreliable indicator of exposure. Repeated or prolonged dermal contact with this material may cause severe allergic skin reactions. Such allergic reactions may be incapacitating for an extended period of time. Overexposure to hydrogen sulfide gas may cause severe eye or respiratory tract irritation, rapid development of coma and respiratory failure. Low levels of hydrogen sulfide may cause headache, dizziness, staggering gait, neurological damage and gastritis. Refer to Section 11 for toxicology information on the regulated components of this product.

3. COMPOSITION/INFORMATION ON INGREDIENTS

WHMIS REGULATED COMPONENTS

Component / CAS No.	**% (w/w)**	**Carcinogen**
Sodium diisobutyl dithiophosphate 53378-51-1	30 - 60	Not applicable
Sodium hydroxide 1310-73-2	1	Not applicable

4. FIRST AID MEASURES

Ingestion:
If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

Skin Contact:
Take off immediately all contaminated clothing. Wear impermeable gloves. Wash immediately with plenty of water and soap. Pay particular attention to skin crevices, nail folds, etc. Do not reuse contaminated clothing without laundering. Do not reuse contaminated leatherware.

Eye Contact:
Rinse immediately with plenty of water for at least 15 minutes. Obtain medical attention immediately.

Inhalation:
Remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media:
Use water spray, alcohol foam, carbon dioxide or dry chemical to extinguish fires.

Protective Equipment:
Firefighters, and others exposed, wear self-contained breathing apparatus. Wear full firefighting protective clothing. See MSDS Section 8 (Exposure Controls/Personal Protection).

Special Hazards:
Sulfur dioxide or hydrogen sulfide may be formed under fire conditions. Do not flush to sewer which may contain acid. This could result in generation of toxic and explosive hydrogen sulfide gas.

Mechanical/Static Sensitivity Statements:
This product should not be mixed with acids since evolution of toxic and explosive hydrogen sulfide gas could result. This precaution does not, of course, apply to addition of this reagent to flotation pulps in amounts customarily used in flotation.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:
Where exposure level is not known, wear approved, positive pressure, self-contained respirator. Where exposure level is known, wear approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section 8, wear a two piece PVC suit with hood or PVC overalls with hood.

Methods For Cleaning Up:
Cover spills with some inert absorbent. Sweep up into containers for disposal. Flush spill area with water.

7. HANDLING AND STORAGE

HANDLING

Precautionary Measures: Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Special Handling Statements: Large quantities of undiluted product should not be mixed with acids, since evolution of toxic and explosive hydrogen sulphide gas could result. In particular, precautions most be taken to avoid the accidental discharge of large volumes of the product in acid storage tanks or any tank or containment containing acidic materials. This precaution does not, of course, apply to addition of this reagent to flotation pulps in amounts customarily used in flotation, were the reagent amounts are small and instantly diluted to concentrations well below the solubility limits.

STORAGE
Freezing and thawing of this product will not affect its activity. However, if freezing and thawing does take place, mix product thoroughly before using.

Storage Temperature: Room temperature
Reason: Quality.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Measures:
Utilize a closed system process where feasible. Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure.

Respiratory Protection:
For operations where inhalation exposure can occur, use an approved respirator recommended by an industrial hygienist after an evaluation of the operation. Where inhalation exposure can not occur, no respiratory protection is required. A full facepiece respirator also provides eye and face protection.

Eye Protection:
Prevent eye and skin contact. Provide eye wash fountain and safety shower in close proximity to points of potential exposure. Wear eye/face protection such as chemical splash proof goggles or face shield.

Skin Protection:
Prevent contamination of skin or clothing when removing protective equipment. Wear impermeable gloves and suitable protective clothing.

Additional Advice:
Food, beverages, and tobacco products should not be carried, stored, or consumed where this material is in use. Before eating, drinking, or smoking, wash face and hands thoroughly with soap and water.

Exposure Limit(s)

1310-73-2 Sodium hydroxide

ACGIH (TLV):	2 mg/m^3 (Ceiling)
AIHA (WEEL):	Not established
Other Value:	Not established

9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	amber-brown
Appearance:	liquid
Odor:	sulfur
Boiling Point:	Not available
Melting Point:	<-21 °C -5 °F (freezing point)
Vapor Pressure:	Similar to water
Specific Gravity/Density:	1.105 @ 25 °C
Vapor Density:	Similar to water
Percent Volatile (% by wt.):	~50(water)
pH:	>12
Saturation In Air (% By Vol.):	Similar to water
Evaporation Rate:	Similar to water
Solubility In Water:	Complete
Volatile Organic Content:	Not available
Flash Point:	>93 °C 200 °F Setaflash Closed Cup
Flammable Limits (% By Vol):	Not applicable
Autoignition Temperature:	Not available
Decomposition Temperature:	Not available
Partition coefficient (n-octanol/water):	Not available
Odor Threshold:	Not available

10. STABILITY AND REACTIVITY

Stability:	Stable
Conditions To Avoid:	None known
Polymerization:	Will not occur
Conditions To Avoid:	None known
Materials To Avoid:	This product contains a neutralized dithio acid. Avoid contact with strong oxidizing agents and mineral acids.
Hazardous Decomposition Products:	Carbon monoxide (CO) Carbon dioxide hydrogen sulfide (H2S) oxides of sulfur (includes sulfur di and tri oxides) oxides of phosphorus

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 2. HAZARDS IDENTIFICATION.
Toxicological information on the regulated components of this product is as follows:

Sodium hydroxide is corrosive to eyes, skin, and the soft tissues of the digestive and respiratory tracts. Even dilute solutions of sodium hydroxide can produce irreversible damage to eyes and skin. A one percent solution/24 hrs. caused severe eye irritation in monkeys. Acute overexposure to sodium hydroxide mists or dusts causes severe respiratory irritation. The acute oral (rat) and dermal (rabbit) LD50 values are 104-340 mg/kg and 1250 mg/kg, respectively. The human oral LDLo is 1.57 mg/kg.

Sodium diisobutyldithiophosphate has estimated acute oral (rat) and dermal (rabbit) LD50 values of greater than 5000 mg/kg and 2000 mg/kg, respectively. Direct contact with sodium diisobutyldithiophosphate can cause eye burns and skin corrosion.

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12. ECOLOGICAL INFORMATION

This material is not classified as dangerous for the environment.
This material is not readily biodegradable.

FISH TEST RESULTS

Test: Acute toxicity, freshwater (OECD 203)
Duration: 96 hr.
Species: Rainbow Trout (Oncorhyncus mykiss)
>125 mg/l LC50

INVERTEBRATE TEST RESULTS

Test: Acute Immobilization (OECD 202)
Duration: 48 hr
Species: Water Flea (Daphnia magna)
132 mg/l EC50

DEGRADATION

Test: Closed Bottle (OECD 301D)
Duration: 28 day **Procedure:** Ready biodegradability
11.6 % Material does not significantly bioaccumlate

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13. DISPOSAL CONSIDERATIONS

The Company encourages the recycle, recovery and reuse of materials, where permitted, as an alternative to disposal as a waste. The Company recommends that organic materials classified as hazardous waste according to the relevant local or national regulations be disposed of by thermal treatment or incineration at approved facilities. All local and national regulations should be followed.

13. DISPOSAL CONSIDERATIONS

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14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

US DOT

Dangerous Goods? X
Proper Shipping Name: Caustic alkali liquid, n.o.s.
Hazard Class: 8
Packing Group: II
UN/ID Number: UN1719
Transport Label Required: Corrosive
Technical Name (N.O.S.): Dithiophosphate salt

TRANSPORT CANADA

Dangerous Goods? X
Proper Shipping Name: Caustic alkali liquid, n.o.s.
Hazard Class: 8
Packing Group: II
UN Number: UN1719
Transport Label Required: Corrosive
Technical Name (N.O.S.): Contains dithiophosphate salt

ICAO / IATA

Dangerous Goods? X
Proper Shipping Name: Caustic alkali liquid, n.o.s.
Hazard Class: 8
Packing Group: II
UN Number: UN1719
Transport Label Required: Corrosive
Passenger Aircraft: 809; 1 L
Cargo Aircraft: 813; 30 L
Technical Name (N.O.S.): Contains dithiophosphate salt

IMO

Dangerous Goods? X
Proper Shipping Name: Caustic alkali liquid, n.o.s.
Hazard Class: 8
UN Number: UN1719
Packing Group: II
Transport Label Required: Corrosive
Technical Name (N.O.S.): dithiophosphate salt

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15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the Controlled products Regulations and this Material Safety Data Sheet contains all the information required by the Controlled Products Regulations.

WHMIS CLASSIFICATION:
Class D2B Toxic
Class E Corrosive

Inventory Information

United States (USA): All components of this product are included on the TSCA Chemical Inventory or are not required to be listed on the TSCA Chemical Inventory.

Canada: All components of this product are included on the Domestic Substances List (DSL) or are not required to be listed on the DSL.

Australia: All components of this product are included in the Australian Inventory of Chemical Substances (AICS) or are not required to be listed on AICS.

China: All components of this product are included on the Chinese inventory or are not required to be listed on the Chinese inventory.

Japan: All components of this product are included on the Japanese (ENCS) inventory or are not required to be listed on the Japanese inventory.

Korea: All components of this product are included on the Korean (ECL) inventory or are not required to be listed on the Korean inventory.

Philippines: All components of this product are included on the Philippine (PICCS) inventory or are not required to be listed on the Philippine inventory.

16. OTHER INFORMATION

NFPA Hazard Rating (National Fire Protection Association)

Health: 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

Fire: 1 - Materials that must be preheated before ignition can occur.

Instability: 0 - Materials that in themselves are normally stable, even under fire exposure conditions.

Reasons For Issue:

Revised Section 2
Revised Section 3
Revised Section 8

Prepared By: Randy Deskin, Ph.D., DABT +1-973-357-3100
05/04/2010

CYTEC

Technology ahead of its time™

MSDS: 0000304
Date: 07/01/2005
Supersedes: 12/18/2003

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **AEROFROTH® 65 Frother**
Synonyms: None
Chemical Family: Polyglycols
Molecular Formula: Mixture
Molecular Weight: Mixture

CYTEC INDUSTRIES INC., FIVE GARRET MOUNTAIN PLAZA, WEST PATERSON, NEW JERSEY 07424, USA
For Product Information call 1-800/652-6013. Outside the USA and Canada call 1-973/357-3193.
EMERGENCY PHONE: For emergency involving spill, leak, fire, exposure or accident call CHEMTREC: 1-800/424-9300. Outside the USA and Canada call 1-703/527-3887.

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2. COMPOSITION/INFORMATION ON INGREDIENTS

OSHA REGULATED COMPONENTS

No Permissible Exposure Limits (PEL/TLV) have been established by OSHA or ACGIH.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR:
Color: reddish-brown
Appearance: liquid
Odor: polyglycol

STATEMENTS OF HAZARD:
CAUTION! MAY CAUSE EYE AND SKIN IRRITATION

POTENTIAL HEALTH EFFECTS

EFFECTS OF EXPOSURE:
The acute oral (rat) LD50 and dermal (rabbit) LD50 values are estimated to be >3000 mg/kg and >2000 mg/kg, respectively. Direct contact with this material may cause mild eye and skin irritation.

4. FIRST AID MEASURES

Ingestion:
Material is not expected to be harmful by ingestion. No specific first aid measures are required.

Skin Contact:
Wash immediately with plenty of water and soap.

Eye Contact:
Rinse immediately with plenty of water for at least 15 minutes.

Inhalation:
Material is not expected to be harmful if inhaled. Remove to fresh air.

5. FIRE-FIGHTING MEASURES

Extinguishing Media:
Use water spray, carbon dioxide or dry chemical.

Protective Equipment:
Firefighters, and others exposed, wear self-contained breathing apparatus.

Special Hazards:
Keep containers cool by spraying with water if exposed to fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:
Where exposure level is known, wear approved respirator suitable for level of exposure. Where exposure level is not known, wear approved, positive pressure, self-contained respirator. In addition to the protective clothing/equipment in Section 8 (Exposure Controls/Personal Protection), wear impermeable boots.

Methods For Cleaning Up:
Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Flush spill area with water.

7. HANDLING AND STORAGE

HANDLING

Precautionary Measures: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Special Handling Statements: None

STORAGE
None

Storage Temperature: Room temperature
Reason: Integrity.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Measures:
Engineering controls are not usually necessary if good hygiene practices are followed.

Respiratory Protection:
For operations where inhalation exposure can occur, use an approved respirator recommended by an industrial hygienist after an evaluation of the operation. Where inhalation exposure can not occur, no respiratory protection is required.

Eye Protection:
Wear eye/face protection such as chemical splash proof goggles or face shield.

Skin Protection:
Avoid skin contact. Wear impermeable gloves.

Additional Advice:
Before eating, drinking, or smoking, wash face and hands thoroughly with soap and water.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	reddish-brown		
Appearance:	liquid		
Odor:	polyglycol		
Boiling Point:	Not available		
Melting Point:	-37 °C	-35 °F	
Vapor Pressure:	19.86mm Hg		
Specific Gravity:	1.01		
Vapor Density:	>1(air = 1)		
Percent Volatile (% by wt.):	Not available		
pH:	7.0 - 10.0(5% aqueous solution)		
Saturation In Air (% By Vol.):	Not applicable		
Evaporation Rate:	Not applicable		
Solubility In Water:	Complete		
Volatile Organic Content:	Not available		
Flash Point:	>93 °C	200 °F	Pensky-Martens Closed Cup
Flammable Limits (% By Vol):	Not available		
Autoignition Temperature:	Not available		
Decomposition Temperature:	Not available		
Partition coefficient (n-octanol/water):	Not available		
Odor Threshold:	Not available		

10. STABILITY AND REACTIVITY

Stability:	Stable
Conditions To Avoid:	None known
Polymerization:	Will not occur
Conditions To Avoid:	None known
Materials To Avoid:	No specific incompatibility
Hazardous Decomposition Products:	None known

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION.
Toxicological information on the regulated components of this product is as follows:

This product contains no OSHA regulated (hazardous) components.

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12. ECOLOGICAL INFORMATION

This material is not classified as dangerous for the environment.
This material is readily biodegradable.

FISH TEST RESULTS

Test: Acute toxicity, freshwater (OECD 203)
Duration: 96 hr. **Procedure:** Static.
Species: Rainbow Trout (Oncorhyncus mykiss)
>100 mg/l LC50

INVERTEBRATE TEST RESULTS

Test: Acute Immobilization (OECD 202)
Duration: 48 hr **Procedure:** Static
Species: Water Flea (Daphnia magna)
>100 mg/l EC50

DEGRADATION

Test: Closed Bottle (OECD 301D)
Duration: 28 day **Procedure:** Ready biodegradability
86.6 %

---

13. DISPOSAL CONSIDERATIONS

The information on RCRA waste classification and disposal methodology provided below applies only to the Cytec product, as supplied. If the material has been altered or contaminated, or it has exceeded its recommended shelf life, the guidance may be inapplicable. Hazardous waste classification under federal regulations (40 CFR Part 261 et seq) is dependent upon whether a material is a RCRA `listed hazardous waste`or has any of the four RCRA `hazardous waste characteristics.`Refer to 40 CFR Part 261.33 to determine if a given material to be disposed of is a RCRA `listed hazardous waste`; information contained in Section 15 of this MSDS is not intended to indicate if the product is a `listed hazardous waste.`RCRA Hazardous Waste Characteristics: There are four characteristics defined in 40 CFR Section 261.21-61.24: Ignitability, Corrosivity, Reactivity, and Toxicity. To determine Ignitability, see Section 9 of this MSDS (flash point). For Corrosivity, see Sections 9 and 14 (pH and DOT corrosivity). For Reactivity, see Section 10 (incompatible materials). For Toxicity, see Section 2 (composition). Federal regulations are subject to change. State and local requirements, which may differ from or be more stringent than the federal regulations, may also apply to the classification of the material if it is to be disposed. Cytec encourages the recycle, recovery and reuse of materials, where permitted, as an alternate to disposal as a waste. Cytec recommends that organic materials classified as RCRA hazardous wastes be disposed of by thermal treatment or incineration at EPA approved facilities. Cytec has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

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14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

US DOT
Proper Shipping Name: Not applicable/Not regulated
Hazardous Substances:
Not applicable

TRANSPORT CANADA
Proper Shipping Name: Not applicable/Not regulated

ICAO / IATA
Proper Shipping Name: Not applicable/Not regulated
Packing Instructions/Maximum Net Quantity Per Package:
Passenger Aircraft: -
Cargo Aircraft: -

IMO
Proper Shipping Name: Not applicable/Not regulated

---

15. REGULATORY INFORMATION

INVENTORY INFORMATION

United States (USA): All components of this product are included on the TSCA Chemical Inventory or are not required to be listed on the TSCA Chemical Inventory.

Canada: All components of this product are included on the Domestic Substances List (DSL) or are not required to be listed on the DSL.

European Union (EU): All components of this product are included on the European Inventory of Existing Chemical Substances (EINECS) or are not required to be listed on EINECS.

Australia: All components of this product are included in the Australian Inventory of Chemical Substances (AICS) or are not required to be listed on AICS.

China: All components of this product are included on the Chinese inventory or are not required to be listed on the Chinese inventory.

Japan: All components of this product are included on the Japanese (ENCS) inventory or are not required to be listed on the Japanese inventory.

Korea: All components of this product are included on the Korean (ECL) inventory or are not required to be listed on the Korean inventory.

Philippines: All components of this product are included on the Philippine (PICCS) inventory or are not required to be listed on the Philippine inventory.

OTHER ENVIRONMENTAL INFORMATION

The following components of this product may be subject to reporting requirements pursuant to Section 313 of CERCLA (40 CFR 372), Section 12(b) of TSCA, or may be subject to release reporting requirements (40 CFR 307, 40 CFR 311, etc.) See Section 13 for information on waste classification and waste disposal of this product.

This product does not contain any components regulated under these sections of the EPA

PRODUCT HAZARD CLASSIFICATION UNDER SECTION 311 OF SARA

- Not applicable

16. OTHER INFORMATION

NFPA Hazard Rating (National Fire Protection Association)

Health: 1 - Materials that, under emergency conditions, can cause significant irritation.

Fire: 1 - Materials that must be preheated before ignition can occur.

Reactivity: 0 - Materials that in themselves are normally stable, even under fire exposure conditions.

Reasons For Issue: Revised Section 15

Randy Deskin, Ph.D., DABT +1-973-357-3100

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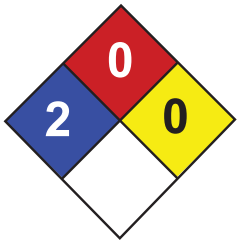
Chemicals & Laboratory Equipment



Health	2
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet

Copper sulfate pentahydrate MSDS

Section 1: Chemical Product and Company Identification

Product Name: Copper sulfate pentahydrate

Catalog Codes: SLC3778, SLC4567, SLC1774, SLC3565, SLC5353

CAS#: 7758-99-8

RTECS: GL8900000

TSCA: TSCA 8(b) inventory: No products were found.

CI#: Not applicable.

Synonym: Blue vitriol; Copper (II) Sulfate Pentahydrate

Chemical Name: Cupric sulfate pentrahydrate

Chemical Formula: CuSO4.5H2O

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Copper sulfate pentahydrate	7758-99-8	100

Toxicological Data on Ingredients: Copper sulfate pentahydrate: ORAL (LD50): Acute: 300 mg/kg [Rat.]. DERMAL (LD50): Acute: >2000 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

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

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
When heated to decomposition it emits toxic fumes. Solutions are acidic and can react with magnesium to evolve flammable hydrogen gas

Special Remarks on Explosion Hazards: Nitromethanes and copper salts spontaneously form explosive materials

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as metals, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 (mg/m3) from ACGIH (TLV) [United States] Inhalation TWA: 0.1 (mg/m3) from OSHA (PEL) [United States] Inhalation TWA: 1 (mg/m3) from NIOSH InhalationConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Crystalline granules solid. Powdered solid.)

Odor: Odorless.

Taste: Nauseous metallic.

Molecular Weight: 249.69 g/mole

Color: Blue. (Light.)

pH (1% soln/water): Not available.

Boiling Point: 150°C (302°F)

Melting Point: 110°C (230°F)

Critical Temperature: Not available.

Specific Gravity: 2.28 @ 15.6 deg. C(Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol.

Solubility:
Easily soluble in hot water. Soluble in cold water, methanol. Solubility in water: 31.6 g/100 ml @ 0 deg. C.; 203.3 g/100 ml @ 100 deg. C Solubility in methanol: 15.6 g/100 ml @ 18 deg. C. Insoluble in ethanol. It readily forms alkaline complexes at sufficiently high concentrations of amines or alkali cyanides. Practically insoluble in most organic solvents.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat (high temperatures), incompatible materials, exposure to air

Incompatibility with various substances: Reactive with metals, alkalis.

Corrosivity: Highly corrosive in presence of steel.

Special Remarks on Reactivity:
Air Sensitive. Slowly efforescent in air. Solutions of hyprobromite are decomposed by powerful catalytic action of cupric ions, even as impurities. Incompatible with finely powdered metals.

Special Remarks on Corrosivity:
Corrosive to finely powdered metals. Very corrosive to plain steel

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD50): 300 mg/kg [Rat.]. Acute dermal toxicity (LD50): >2000 mg/kg [Rat].

Chronic Effects on Humans:
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. May cause damage to the following organs: kidneys, liver.

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose: LDL [Human] - Route: Oral; Dose: 1088 mg/kg

Special Remarks on Chronic Effects on Humans: May affect genetic material based on animal data

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation. May cause skin burns. It may cause and itching allergic eczema. Eyes: Causes eye irritation. May cause eye burns. It may cause conjunctivitis, corneal discoloration, ulceration and turbidity of the cornea. Inhalation: Causes respiratory tract (nose, throat, lung) irritation with coughing and wheezing. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. Burning copper sulfate may result in irritating and poisonous gases which may irritate the respiratory tract and lungs, and may cause fume metal fever which is characterized by flu-like symptoms such as fever, chills, muscle aches. Ingestion: Harmful if swallowed. May cause gastrointestinal tract irritation with nausea, vomiting, diarrhea, metallic taste, burning sensation in the stomach or epigastrum, abdominal pain, and possible gastrointestinal tract bleeding. May affect metabolism(metabolic acidosis), liver (liver damage, jaundice), blood (Methemoglobin, hemalytic anemia), urinary system (kidney damage, hematuria, hemoglobinuria, albuminuria), behavior/nervous systems (somnolence, tremor, psychosis, muscle weakness, coma), cardiovascular system (lowering of blood pressure, dysthrythmia). Oral mucosa, vomitus, stools, and saliva may be stained blue or green following ingestion. Aspiration pneumonia may develop following emesis and CNS depression. Chronic Potential Health Effects: Skin: Repeated or prolonged skin contact may cause thickening of the skin.

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 0.1 ppm 48 hours [Goldfish]. 0.1 mg/l 96 hours [Rainbow Trout]. 2.5 mg/l 96 hours [Rainbow Trout].

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation:
If released to soil, copper sulfate may leach to groundwater, be partly oxidized, or bind to humic materials, clay, or hydrous of iron and manganese. In water, it will bind to carbonates as well as humic materials, clay and hydrous oxides of iron and manganese. Copper is accumulated by plants and animals, but it does not appear to biomagnify from plants to animals. This lack of biomagnification appears common with heavy metals. In air, copper aerosols (in general) have a residence time of 2 to 10 days in an unpolluted atmosphere and 0.1 to >4 in a polluted, urban areas.

Section 13: Disposal Considerations

Waste Disposal:
Copper dusts or mist or copper compounds may be disposed of in Group III sealed containers in a secure sanitary landfill. Copper containing soluble wastes can be concentrated through the use of ion exchange, reverse osmosis, or evaporators to the point where copper can be electrolytically removed and sent to a reclaiming firm. If recovery is not feasible, the copper can be precipitated through the use of caustics and the sludge depositied in a chemical waste landfill. Be sure to consult with authorities (waste regulators). Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 9: Miscellaneous hazardous material.

Identification: : Environmentally hazardous substance, n.o.s. (Cupric Sulfate) UNNA: 3077 PG: III

Special Provisions for Transport:
additional markings "Marine Pollutant" - required for bulk shipments. The words "Marine Pollutant" must be entered on the shipping paper in association iwth the basic DOT description for bulk shipments.

Section 15: Other Regulatory Information

Federal and State Regulations:
SARA 313 toxic chemical notification and release reporting: Copper compounds CERCLA: Hazardous substances.: Copper sulfate pentahydrate: 10 lbs. (4.536 kg)

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada): CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R22- Harmful if swallowed. R36/38- Irritating to eyes and skin. R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S22- Do not breathe dust. S60- This material and its container must be disposed of as hazardous waste. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

Section 16: Other Information

References:
-The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.

Other Special Considerations: Not available.

Created: 10/09/2005 05:01 PM

Last Updated: 06/09/2012 12:00 PM

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✚ MATERIAL SAFETY DATA SHEET ✚

DEPRAMIN

SECTION I: IDENTIFICATION OF PRODUCT

COMPANY: **Diversity Technologies Corp.**
8750 – 53rd Ave.
Edmonton, AB T6E 5G2

DATE: **August 5, 2012**
PHONE: **780-440-4923**
FAX: **780-469-1899**

PRODUCT NAME: **Depramin**
(C, 96, 158, 170, 267, & 347)

PRODUCT USE: Depressant
CHEMICAL FAMILY: Sodium carboxymethylcellulose
CAS #: 9004-32-4

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

WHMIS CLASSIFICATION: Not a controlled product under WHMIS
WORKPLACE HAZARD: Treat as a nuisance dust: Risk of dust explosion.

TRANSPORTATION OF DANGEROUS GOODS (TDG)

PROPER SHIPPING NAME: Not regulated under TDG.
TDG CLASSIFICATION: Not applicable.
UN NUMBER (PIN): Not applicable.
PACKING GROUP: Not applicable.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT	% (w/w)	CAS NUMBER	LD_{50}Oral-Rat	LC_{50}Inhal-Rat	ACGIH-TLV
Contains no WHMIS controlled ingredients					

SECTION III: HEALTH HAZARDS

ROUTE OF ENTRY: ☐ EYE CONTACT ☐ SKIN CONTACT ☐ INHALATION ☐ INGESTION
EYE CONTACT: May cause irritation with tearing and reddening of eyes.
SKIN CONTACT: Prolonged or repeated contact may cause irritation with itching and reddening.
INGESTION: This product is expected to have a low order of oral toxicity. However, overexposure may cause gastrointestinal tract irritation.
INHALATION: Inhaling dust may cause irritation of upper respiratory tract.
CARCINOGENICITY: This product and its ingredients are not listed by IARC, ACGIH, OSHO and EPA.
TERATOGENICITY: No information available.
REPRODUCTIVE TOXICITY: No information available.
MUTAGENICITY: No information available.
SYNERGISTIC PRODUCTS: No information available.

SECTION IV: FIRST AID MEASURES

SKIN CONTACT:	Remove contaminated clothing, shoes and equipment. Wash all affected areas with soap and water. Get medical attention if irritation occurs and persists.
EYE CONTACT:	Flush with gently flowing warm water for 15 minutes or until irritation ceases. Remove contact lenses, if present. Hold eyelids open to ensure thorough flushing. If irritation persists obtain medical attention.
INGESTION:	Do not induce vomiting unless directed to do so by medical personnel. If victim if fully conscious, rinse mouth and give one to two glasses of water to dilute material in stomach. Never give anything by mouth if patient is unconscious, rapidly losing consciousness or convulsing. Obtain medical attention if health effects occur or if large quantity of product has been swallowed.
INHALATION:	Move to fresh air. Apply oxygen or artificial respiration if required. If breathing difficulties, or distress, continue obtain medical attention.

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOUR:	Off-white hygroscopic powder; odourless		
SPECIFIC GRAVITY:	No data		
BOILING POINT (°C):	Not applicable		
MELTING POINT (°C):	Not applicable		
SOLUBILITY IN WATER:	Limited by viscosity	pH:	7-10 (1% solution)
PERCENT VOLATILE BY VOLUME:	Not applicable		
EVAPORATION RATE:	Not applicable		
VAPOUR PRESSURE (mmHg):	Not applicable		
VAPOUR DENSITY (air = 1):	Not applicable		
BULK DENSITY:	450-900 kg/m3		

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	Not applicable	
FLAMMABLE LIMITS:	Upper = 0.8% (200 mesh)	Lower = 0.6% (200 mesh)
EXTINGUISHING MEDIA:	Water spray, foam, dry chemical or CO2.	
SPECIAL FIRE FIGHTING PROCEDURES:	Self-contained breathing apparatus required for fire fighting personnel. Move containers from fire area, or cool with water spray, if possible.	
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Material becomes very slippery when contacted with water. May form explosive dust-air mixtures. In all cases storage systems should be electrically grounded and attention paid to eliminating likely sources of ignition.	

HAZARDOUS COMBUSTION PRODUCTS:	No information available.

SECTION VII: REACTIVITY DATA

STABILITY:	☑ STABLE	☐ UNSTABLE
INCOMPATIBILITY (CONDITIONS TO AVOID):	Avoid creating dust clouds.	
CONDITIONS OF REACTIVITY:	Not known.	
HAZARDOUS DECOMPOSITION PRODUCTS:	Oxides of carbon on combustion.	
HAZARDOUS POLYMERIZATION:	☑ WILL NOT OCCUR	☐ MAY OCCUR

SECTION VIII: PREVENTIVE MEASURES

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:	Suggest dust mask; nuisance dust.
VENTILATION:	Local exhaust ventilation required if dust clouds generated during handling.
PROTECTIVE GLOVES:	Not required.
EYE PROTECTION:	Suggest safety glasses with side shields or goggles.
OTHER PROTECTIVE EQUIPMENT (SPECIFY):	Ensure eyewash station and emergency shower are available.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

WARNING: Static charges generated by emptying package in or near flammable vapours may cause flash fire. May form flammable dust-air mixture. Avoid ignition sources such as sparks and flame. Ground all equipment. In addition, when emptying bags where flammable vapours may be present, blanket vessel with inert gas, ground operator, and pour material slowly into conductive, grounded chute. Dust mask and safety goggles are recommended as airborne powder may be irritating to eyes and nose. Launder contaminated clothing before reuse. Store in a dry place and prevent tearing as product will pick-up ambient moisture. Do not store with oxidizing agents.

STEPS TO BE TAKEN IN CASE THE MATERIAL IS SPILLED OR RELEASED

Use appropriate safety equipment. Eliminate ignition sources. Use non-sparking tools. Use vacuum, if possible, to reduce dust generation during clean-up. Collect uncontaminated material for repackaging. Collect contaminated material in an approved container for disposal.

WASTE DISPOSAL METHOD

Dispose of material in accordance with federal, provincial and local regulations. It may be possible to landfill this material in some areas; check with local operator. It is the responsibility of the end user to determine if material meets the criteria of hazardous waste at the time of disposal.

SECTION IX: PREPARATION

The information contains herein is given in good faith, but no warranty, expressed or implied, is made.

DATE ISSUED:	**August 5, 2012**
SUPERSEDES:	August 3, 2009
BY:	Regulatory Affairs
PHONE:	780-440-4923

Material Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**METHYL ISOBUTYL CARBINOL**
Other name(s):	Methyl amyl alcohol; 4-Methyl-2-pentanol; Isobutyl methyl carbinol; MIBC.
Recommended Use:	Solvent; mineral floatation agent.
Supplier:	Orica Australia Pty Ltd
ABN:	004 117 828
Street Address:	1 Nicholson Street, Melbourne 3000 Australia
Telephone Number:	+61 3 9665 7111
Facsimile:	+61 3 9665 7937
Emergency Telephone:	**1 800 033 111 (ALL HOURS)**

2. HAZARDS IDENTIFICATION

This material is hazardous according to criteria of NOHSC; HAZARDOUS SUBSTANCE.

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

Risk Phrases:	Flammable. Irritating to respiratory system.
Safety Phrases:	Do not breathe vapour. Avoid contact with skin and eyes.
Poisons Schedule:	None allocated.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components / CAS Number	Proportion	Risk Phrases
Methyl isobutyl carbinol 108-11-2	99%	R10, R37

4. FIRST AID MEASURES

Inhalation: Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.

Skin Contact:	If skin contact occurs, remove contaminated clothing and wash skin with running water. If irritation occurs seek medical advice.
Eye Contact:	If in eyes, wash out immediately with water. In all cases of eye contamination it is a sensible precaution to seek medical advice.
Ingestion:	Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.
Medical attention and special treatment:	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Hazards from combustion products:	Flammable liquid. May form flammable vapour mixtures with air. Vapour may travel a considerable distance to source of ignition and flash back.
Precautions for fire fighters and special protective equipment:	On burning will emit toxic fumes, including those of oxides of carbon . Heating can cause expansion or decomposition of the material, which can lead to the containers exploding. If safe to do so, remove containers from the path of fire. Keep containers cool with water spray. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to vapour or products of combustion.
Suitable Extinguishing Media:	Foam, dry agent (carbon dioxide, dry chemical powder).
Hazchem Code:	3[Y]

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures:	Shut off all possible sources of ignition. Clear area of all unprotected personnel. If contamination of sewers or waterways has occurred advise local emergency services.
Methods and materials for containment and clean up:	Slippery when spilt. Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contact and breathing in vapours. Work up wind or increase ventilation. Contain - prevent run off into drains and waterways. Use absorbent (soil, sand or other inert material). Use a spark-free shovel. Collect and seal in properly labelled containers or drums for disposal.

7. HANDLING AND STORAGE

Conditions for safe storage:	Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from sources of heat or ignition. Store away from incompatible materials described in Section 10. Keep containers closed when not in use - check regularly for leaks.

Precautions for safe handling:	Avoid skin and eye contact and breathing in vapour. All potential sources of ignition (open flames, pilot lights, furnaces, spark producing switches and electrical equipment etc) must be eliminated both in and near the work area. Do NOT smoke.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Methyl isobutyl carbinol: 8hr TWA = 104 mg/m3 (25 ppm), 15 min STEL = 167 mg/m3 (40 ppm), Sk

As published by the National Occupational Health and Safety Commission.

TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

STEL (Short Term Exposure Limit) - the average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight hour work day. According to current knowledge this concentration should neither impair the health of, nor cause undue discomfort to, nearly all workers.

\`Sk' Notice - absorption through the skin may be a significant source of exposure. The exposure standard is invalidated if such contact should occur.

These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Engineering controls:
Ensure ventilation is adequate and that air concentrations of components are controlled below quoted Exposure Standards. Vapour heavier than air - prevent concentration in hollows or sumps. DO NOT enter confined spaces where vapour may have collected. If inhalation risk exists: Use with local exhaust ventilation or while wearing organic vapour respirator. Keep containers closed when not in use.

Personal Protective Equipment:
The selection of PPE is dependant on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Orica Personal Protection Guide No. 1, 1998: G - OVERALLS, SAFETY SHOES, SAFETY GLASSES, GLOVES, RESPIRATOR.

Wear overalls, safety glasses and impervious gloves. Use with adequate ventilation. If inhalation risk exists wear organic vapour respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Clear Liquid

Colour:	Colourless
Odour:	Slightly Irritating , Alcohol
Molecular Formula:	(CH3)2CHCH2CH(OH)CH3
Specific Gravity:	0.808 @20°C
Relative Vapour Density (air=1):	3.53
Vapour Pressure (20 °C):	4.7 mm Hg
Flash Point (°C):	42.4
Flammability Limits (%):	1 - 5.5
Autoignition Temperature (°C):	360.3
Solubility in water (g/L):	18.2
Boiling Point/Range (°C):	132
pH:	Not available
Freezing Point/Range (°C):	< -50

10. STABILITY AND REACTIVITY

Chemical stability:	Stable.
Conditions to avoid:	Avoid exposure to heat, sources of ignition, and open flame.
Incompatible materials:	Incompatible with strong inorganic acids , and oxidising agents .
Hazardous decomposition products:	Oxides of carbon.
Hazardous reactions:	Hazardous polymerisation will not occur.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion: Swallowing can result in nausea, vomiting and central nervous system depression. If the victim is showing signs of central system depression (like those of drunkeness) there is greater likelihood of the patient breathing in vomit and causing damage to the lungs.

Eye contact: May be an eye irritant.

Skin contact: Contact with skin may result in irritation. Will have a degreasing action on the skin. Repeated or prolonged skin contact may lead to irritant contact dermatitis. Can be absorbed through the skin with resultant adverse effects.

Inhalation: Material is irritant to the mucous membranes of the respiratory tract (airways). Breathing in vapour can result in headaches, dizziness, drowsiness, and possible nausea. Breathing in high concentrations can produce central nervous system depression, which can lead to loss of co-ordination, impaired judgement and if exposure is prolonged, unconsciousness.

Long Term Effects:

No information available for the product.

Toxicological Data:

Oral LD50 (rat):	2600 mg/kg.
Dermal LD50 (rabbit):	2900 mg/kg.
Inhalation LC50 (rat):	>3776 ppm/4hr

12. ECOLOGICAL INFORMATION

Ecotoxicity	Avoid contaminating waterways.

13. DISPOSAL CONSIDERATIONS

Disposal methods:	Refer to Waste Management Authority. Dispose of material through a licensed waste contractor. Advise flammable nature. Normally suitable for incineration by an approved agent.

14. TRANSPORT INFORMATION

Road and Rail Transport

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

UN No:	2053
Class-primary	3 Flammable Liquid
Packing Group:	III
Proper Shipping Name:	METHYL ISOBUTYL CARBINOL
Hazchem Code:	3[Y]

Marine Transport

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; DANGEROUS GOODS.

UN No:	2053
Class-primary:	3 Flammable Liquid
Packing Group:	III
Proper Shipping Name:	METHYL ISOBUTYL CARBINOL

Air Transport

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.

UN No:	2053
Class-primary:	3 Flammable Liquid
Packing Group:	III
Proper Shipping Name:	METHYL ISOBUTYL CARBINOL

15. REGULATORY INFORMATION

Classification:	This material is hazardous according to criteria of NOHSC; HAZARDOUS SUBSTANCE.
Hazard Category:	Xi: Irritant
Risk Phrase(s):	R10: Flammable. R37: Irritating to respiratory system.
Safety Phrase(s):	S23: Do not breathe vapour/mist/aerosol. S24/25: Avoid contact with skin and eyes. S36/37: Wear suitable protective clothing and gloves.
Poisons Schedule:	None allocated.

This material is listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Supplier Material Safety Data Sheet; 02/ 2006.

This material safety data sheet has been prepared by SH&E Shared Services, Orica.

Reason(s) for Issue:
Revised Primary MSDS

This MSDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**SODIUM HYDROSULPHIDE**
Other name(s):	Sodium hydrosulfide; Sodium hydrogen sulphide; Sodium bisulphide; Sodium mercaptan; Sodium sulphhydrate; Sodium hydrosulfide; Sodium hydrosulfide dihydrate.
Recommended Use:	Paper pulping, dyestuffs processing, rayon and cellophane desulfurising, unhairing hides, bleaching agent.
Supplier:	Orica Australia Pty Ltd
ABN:	99 004 117 828
Street Address:	1 Nicholson Street, Melbourne 3000 Australia
Telephone Number:	+61 3 9665 7111
Facsimile:	+61 3 9665 7937
Emergency Telephone:	**1 800 033 111 (ALL HOURS)**

2. HAZARDS IDENTIFICATION

This material is hazardous according to criteria of Safe Work Australia; HAZARDOUS SUBSTANCE.

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

Risk Phrases:	Contact with acids liberates toxic gas. Causes burns. Risk of serious damage to eyes.
Safety Phrases:	Do not breathe dust. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible).
Poisons Schedule:	None allocated.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Risk Phrases
Sodium hydrosulfide	16721-80-5	>70%	R31, R34, R41
Water of crystallisation	7732-18-5	>=25%	-

4. FIRST AID MEASURES

Inhalation:
Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.

Skin Contact:
If spilt on large areas of skin or hair, immediately drench with running water and remove clothing. Continue to wash skin and hair with plenty of water (and soap if material is insoluble) until advised to stop by the Poisons Information Centre or a doctor. For skin burns, cover with a clean, dry dressing until medical help is available.

Eye Contact:
If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre or a doctor, or for at least 15 minutes.

Ingestion:
Immediately rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.

Medical attention and special treatment:
Treat symptomatically. Can cause corneal burns.

5. FIRE FIGHTING MEASURES

Hazards from combustion products:
Non-combustible material.

Precautions for fire fighters and special protective equipment:
Decomposes on heating emitting toxic fumes, including those of hydrogen sulfide , and oxides of sulfur . Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition.

Suitable Extinguishing Media:
Not combustible, however, if material is involved in a fire use: Fine water spray, normal foam, dry agent (carbon dioxide, dry chemical powder).

Hazchem Code: 2X

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures:
Clear area of all unprotected personnel. If contamination of sewers or waterways has occurred advise local emergency services.

Methods and materials for containment and clean up:
Wear protective equipment to prevent skin and eye contact and breathing in dust. Work up wind or increase ventilation. Cover with damp absorbent (inert material, sand or soil). Sweep or vacuum up, but avoid generating dust. Collect and seal in properly labelled containers or drums for disposal. Wash area down with excess water.

7. HANDLING AND STORAGE

Conditions for safe storage:
Store in a cool, dry, well ventilated place and out of direct sunlight. Protect from moisture. Store away from incompatible materials described in Section 10. Do not store in aluminium, copper, or zinc containers. Keep containers closed when not in use - check regularly for spills.

Precautions for safe handling:
Avoid skin and eye contact and breathing in dust.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits: No value assigned for this specific material by the National Occupational Health and Safety Commission. However, Exposure Standard(s) for constituent(s) and decomposition product(s):

Dusts not otherwise classified: 8hr TWA = 10 mg/m^3
Hydrogen sulfide: 8hr TWA = 14 mg/m^3 (10 ppm), 15 min STEL 21 mg/m^3 (15 ppm)

As published by the National Occupational Health and Safety Commission.

TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

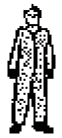
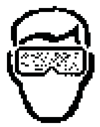
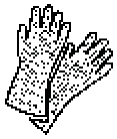
STEL (Short Term Exposure Limit) - the average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight hour work day. According to current knowledge this concentration should neither impair the health of, nor cause undue discomfort to, nearly all workers.

These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Engineering controls:
Ensure ventilation is adequate and that air concentrations of components are controlled below quoted Exposure Standards. Avoid generating and breathing in dusts. Use with local exhaust ventilation or while wearing dust mask. Keep containers closed when not in use.

Personal Protective Equipment:
The selection of PPE is dependant on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Orica Personal Protection Guide No. 1, 1998: F - OVERALLS, SAFETY SHOES, CHEMICAL GOGGLES, GLOVES, DUST MASK.


Wear overalls, chemical goggles and impervious gloves. Avoid generating and inhaling dusts. If dust exists, wear dust mask/respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Chips or Flakes
Colour:	Yellow
Odour:	Rotten egg
Molecular Formula:	HNaS.2H2O
Solubility:	Soluble in water.
Specific Gravity:	1.5
Relative Vapour Density (air=1):	Not applicable
Vapour Pressure (20 °C):	Not applicable
Flash Point (°C):	Not applicable
Flammability Limits (%):	Not available
Autoignition Temperature (°C):	120
Melting Point/Range (°C):	55
Boiling Point/Range (°C):	>150
pH:	11 (10 g/L water)

10. STABILITY AND REACTIVITY

Chemical stability:	Deliquescent. Corrosive to aluminium , copper , and zinc .
Conditions to avoid:	Avoid exposure to moisture. Avoid exposure to heat, sources of ignition, and open flame. Avoid dust generation.
Incompatible materials:	Incompatible with acids , water , moisture , carbon , diazonium salts , and oxidising agents .
Hazardous decomposition products:	Hydrogen sulfide. Oxides of sulfur.
Hazardous reactions:	Sodium hydrosulfide releases highly toxic and highly flammable hydrogen sulfide gas if mixed with an acid or if exposed to excessive heat. Hydrogen sulfide has a pungent rotten egg odour.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion:	Swallowing can result in nausea, vomiting, diarrhoea, abdominal pain and chemical burns to the gastrointestinal tract.
Eye contact:	A severe eye irritant. Corrosive to eyes; contact can cause corneal burns. Contamination of eyes can result in permanent injury.
Skin contact:	Contact with skin will result in severe irritation. Corrosive to skin - may cause skin burns.
Inhalation:	Breathing in dust may result in respiratory irritation.

Long Term Effects:
May cause impaired memory, paralysis, impairment of the central nervous system.

Toxicological Data:
Oral LD50 (rat): 200 mg/kg

12. ECOLOGICAL INFORMATION

Ecotoxicity	Avoid contaminating waterways.
Terrestrial toxicity:	Very toxic to terrestrial species.

13. DISPOSAL CONSIDERATIONS

Disposal methods:
Refer to local government authority for disposal recommendations. Dispose of material through a licensed waste contractor. Decontamination and destruction of containers should be considered.

14. TRANSPORT INFORMATION

14. TRANSPORT INFORMATION

Road and Rail Transport

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

UN No: 2949
Class-primary 8 Corrosive
Packing Group: II
Proper Shipping Name: SODIUM HYDROSULPHIDE, HYDRATED
Hazchem Code: 2X

Marine Transport

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; DANGEROUS GOODS.

UN No: 2949
Class-primary: 8 Corrosive
Packing Group: II
Proper Shipping Name: SODIUM HYDROSULPHIDE HYDRATED

IMDG EMS Fire: F-A
IMDG EMS Spill: S-B

Air Transport

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.

UN No: 2949
Class-primary: 8 Corrosive
Packing Group: II
Proper Shipping Name: SODIUM HYDROSULPHIDE HYDRATED

15. REGULATORY INFORMATION

Classification: This material is hazardous according to criteria of Safe Work Australia; HAZARDOUS SUBSTANCE.

Hazard Category: C: Corrosive

Risk Phrase(s):
R31: Contact with acids liberates toxic gas.
R34: Causes burns.
R41: Risk of serious damage to eyes.

Safety Phrase(s):
S22: Do not breathe dust.
S24/25: Avoid contact with skin and eyes.
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.
S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible).

Poisons Schedule: None allocated.

All the constituents of this material are listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Supplier Material Safety Data Sheet; 03/ 2004.

This safety data sheet has been prepared by SH&E Shared Services, Orica.

Reason(s) for Issue:
5 Yearly Revised Primary SDS
Change to Transport Information

This SDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

Material Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**SODIUM METABISULPHITE (ALL GRADES)**
Other name(s):	Sodium metabisulfite; Sodium pyrosulphite; Disodium pyrosulphite; SMB powder; Grape guards; Sodium disulphite.
Recommended Use:	Preservative for foods; antioxidant.
Supplier:	Orica Australia Pty Ltd
ABN:	99 004 117 828
Street Address:	1 Nicholson Street, Melbourne 3000 Australia
Telephone Number:	+61 3 9665 7111
Facsimile:	+61 3 9665 7937
Emergency Telephone:	**1 800 033 111 (ALL HOURS)**

2. HAZARDS IDENTIFICATION

This material is hazardous according to criteria of Safe Work Australia; HAZARDOUS SUBSTANCE.

Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; NON-DANGEROUS GOODS.

Risk Phrases:	Harmful if swallowed. Contact with acids liberates toxic gas. Risk of serious damage to eyes.
Safety Phrases:	Do not breathe dust. Avoid contact with eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear eye / face protection. If swallowed, seek medical advice immediately and show this container or label.
Poisons Schedule:	S5 Caution.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Risk Phrases
Sodium metabisulfite	7681-57-4	100%	R22, R31, R41

4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (e.g. phone Australia 131 126; New Zealand 0800 764 766) or a doctor.

Inhalation:
Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.

Skin Contact:
If skin contact occurs, remove contaminated clothing and wash skin with running water. If irritation occurs seek medical advice.

Eye Contact:
Immediately wash in and around the eye area with large amounts of water for at least 15 minutes. Eyelids to be held apart. Remove clothing if contaminated and wash skin. Urgently seek medical assistance. Transport to hospital or medical centre.

Ingestion:
Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.

Medical attention and special treatment:
Treat symptomatically. Can cause corneal burns.

5. FIRE FIGHTING MEASURES

Hazards from combustion products:
Non-combustible material.

Precautions for fire fighters and special protective equipment:
Decomposes on heating emitting toxic fumes, including those of sulfur dioxide . Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition.

Suitable Extinguishing Media:
Not combustible, however, if material is involved in a fire use: Fine water spray, normal foam, dry agent (carbon dioxide, dry chemical powder).

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures:
Clear area of all unprotected personnel. If contamination of sewers or waterways has occurred advise local emergency services.

Methods and materials for containment and clean up:
Wear protective equipment to prevent skin and eye contact and breathing in dust. Work up wind or increase ventilation. Cover with damp absorbent (inert material, sand or soil). Sweep or vacuum up, but avoid generating dust. Collect and seal in properly labelled containers or drums for disposal. Wash area down with excess water.

7. HANDLING AND STORAGE

This material is a Scheduled Poison S5 and must be stored, maintained and used in accordance with the relevant regulations.

Conditions for safe storage:
Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from foodstuffs. Store away from incompatible materials described in Section 10. Keep containers closed when not in use - check regularly for spills.

Precautions for safe handling:
Avoid skin and eye contact and breathing in dust. Avoid handling which leads to dust formation. Keep out of reach of children.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Sodium metabisulfite: 8hr TWA = 5 mg/m^3

As published by the National Occupational Health and Safety Commission.

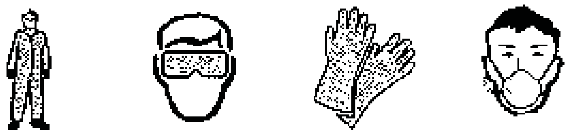
TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Engineering controls:
Ensure ventilation is adequate to maintain air concentrations below Exposure Standards. Avoid generating and breathing in dusts. Use with local exhaust ventilation or while wearing dust mask. Keep containers closed when not in use.

Personal Protective Equipment:
The selection of PPE is dependant on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Orica Personal Protection Guide No. 1, 1998: F - OVERALLS, SAFETY SHOES, CHEMICAL GOGGLES, GLOVES, DUST MASK.



Wear overalls, chemical goggles and impervious gloves. Avoid generating and inhaling dusts. If dust exists, wear dust mask/respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Solid
Colour:	White
Odour:	Characteristic
Molecular Formula:	Na2 O5 S2
Solubility:	Soluble in water.
Specific Gravity:	1.48
Relative Vapour Density (air=1):	Not available
Vapour Pressure (20 °C):	Not available
Flash Point (°C):	Not available
Flammability Limits (%):	Not available
Autoignition Temperature (°C):	Not available
Solubility in water (g/L):	640 @20°C
Melting Point/Range (°C):	ca. 150
Decomposition Point (°C):	>150
pH:	4.0-5.0 (50g/water, 20°C)

10. STABILITY AND REACTIVITY

Chemical stability:	Slowly oxidized on exposure to air and moisture.
Conditions to avoid:	Avoid exposure to heat.
Incompatible materials:	Incompatible with acids , and oxidising agents .
Hazardous decomposition products:	Sulfur dioxide.
Hazardous reactions:	None known.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion:	Swallowing can result in nausea, vomiting, diarrhoea, and abdominal pain.
Eye contact:	A severe eye irritant. Contamination of eyes can result in permanent injury.
Skin contact:	Contact with skin may result in irritation. May cause skin sensitisation in sensitive individuals. Repeated or prolonged skin contact may lead to allergic contact dermatitis.
Inhalation:	Breathing in dust may result in respiratory irritation. May cause respiratory sensitisation in sensitive individuals, producing asthma-like symptoms.

Long Term Effects:
Sodium metabisulfite can sensitise the respiratory tract of allergic persons.

Toxicological Data:
Oral LD50 (rat): 1540 mg/kg.

12. ECOLOGICAL INFORMATION

Ecotoxicity	Avoid contaminating waterways.
96hr LC50 (fish):	150-220 mg/L (S. gairdnerii)

13. DISPOSAL CONSIDERATIONS

Disposal methods:
Refer to Waste Management Authority. Dispose of material through a licensed waste contractor.

14. TRANSPORT INFORMATION

Road and Rail Transport
Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; NON-DANGEROUS GOODS.

Marine Transport
Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; NON-DANGEROUS GOODS.

Air Transport
Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; NON-DANGEROUS GOODS.

15. REGULATORY INFORMATION

Classification:	This material is hazardous according to criteria of Safe Work Australia; HAZARDOUS SUBSTANCE.
Hazard Category:	Xn: Harmful Xi: Irritant
Risk Phrase(s):	R22: Harmful if swallowed. R31: Contact with acids liberates toxic gas. R41: Risk of serious damage to eyes.
Safety Phrase(s):	S22: Do not breathe dust. S25: Avoid contact with eyes. S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S39: Wear eye / face protection. S46: If swallowed, seek medical advice immediately and show this container or label.
Poisons Schedule:	S5 Caution.

This material is listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Supplier Material Safety Data Sheet; not dated.

This material safety data sheet has been prepared by SH&E Shared Services, Orica.

Reason(s) for Issue:
5 Yearly Revised Primary MSDS

This MSDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

Material Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**SODIUM SULPHITE**
Other name(s):	Na Sulfite; Na Sulphite; Sodium sulfite.
Recommended Use:	Antioxidant, bleaching, preservative, reducing agent.
Supplier:	Orica Australia Pty Ltd
ABN:	004 117 828
Street Address:	1 Nicholson Street, Melbourne 3000 Australia
Telephone Number:	+61 3 9665 7111
Facsimile:	+61 3 9665 7937
Emergency Telephone:	**1 800 033 111 (ALL HOURS)**

2. HAZARDS IDENTIFICATION

Based on available information, not classified as hazardous according to criteria of ASCC; NON-HAZARDOUS SUBSTANCE.

Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; NON-DANGEROUS GOODS.

Risk Phrases:	Contact with acids liberates toxic gas.
Safety Phrases:	Keep away from acids .
Poisons Schedule:	None allocated.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components / CAS Number	Proportion	Risk Phrases
Sodium sulfite 7757-83-7	98%	-

4. FIRST AID MEASURES

Inhalation: Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.

Skin Contact:	If skin contact occurs, remove contaminated clothing and wash skin with running water. If irritation occurs seek medical advice.
Eye Contact:	If in eyes, wash out immediately with water. In all cases of eye contamination it is a sensible precaution to seek medical advice.
Ingestion:	Rinse mouth with water. If swallowed, give a glass of water to drink. If vomiting occurs give further water. Seek medical advice.
Medical attention and special treatment:	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Hazards from combustion products:	Non-combustible material.
Precautions for fire fighters and special protective equipment:	Decomposes on heating emitting toxic fumes, including those of oxides of sulfur . Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition.
Suitable Extinguishing Media:	Not combustible, however, if material is involved in a fire use: Water fog (or if unavailable fine water spray), foam, dry agent (carbon dioxide, dry chemical powder).

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures:	If contamination of sewers or waterways has occurred advise local emergency services.
Methods and materials for containment and clean up:	Wear protective equipment to prevent skin and eye contact and breathing in dust. Work up wind or increase ventilation. Cover with damp absorbent (inert material, sand or soil). Sweep or vacuum up, but avoid generating dust. Collect and seal in properly labelled containers or drums for disposal. Wash area down with excess water.

7. HANDLING AND STORAGE

Conditions for safe storage:	Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from incompatible materials described in Section 10. Keep containers closed when not in use - check regularly for spills.
Precautions for safe handling:	Avoid skin and eye contact and breathing in dust. Avoid handling which leads to dust formation.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits:
No value assigned for this specific material by the National Occupational Health and Safety Commission. However, Exposure Standard(s) for particulates:

Nuisance dust: 8hr TWA = 10 mg/m3
Decomposition product(s):
Sulfur dioxide: 8hr TWA = 5.2 mg/m3 (2 ppm), 15 min STEL = 13 mg/m3 (5 ppm)

As published by the National Occupational Health and Safety Commission.

TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

STEL (Short Term Exposure Limit) - the average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight hour work day. According to current knowledge this concentration should neither impair the health of, nor cause undue discomfort to, nearly all workers.

These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Engineering controls:
Use in well ventilated areas. Ensure ventilation is adequate to maintain air concentrations below Exposure Standards. Avoid generating and breathing in dusts. Use with local exhaust ventilation or while wearing dust mask. Keep containers closed when not in use.

Personal Protective Equipment:
The selection of PPE is dependant on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Orica Personal Protection Guide No. 1, 1998: E - OVERALLS, SAFETY SHOES, SAFETY GLASSES, GLOVES, DUST MASK.

Wear overalls, safety glasses and impervious gloves. Avoid generating and inhaling dusts. If excessive dust exists, wear dust mask/respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Crystalline Powder
Colour:	White / Off-white
Odour:	Slight
Molecular Formula:	Na2SO3
Solubility:	Soluble in water.
Specific Gravity:	2.63 @20°C
Relative Vapour Density (air=1):	Not available

Vapour Pressure (20 °C):	Not available
Flash Point (°C):	Not applicable
Flammability Limits (%):	Not available
Autoignition Temperature (°C):	Not available
Melting Point/Range (°C):	Not available
Decomposition Point (°C):	ca. 600
pH:	11 (20% solution)

10. STABILITY AND REACTIVITY

Chemical stability:	Stable under normal conditions.
Conditions to avoid:	Avoid exposure to moisture.
Incompatible materials:	Incompatible with acids , and oxidising agents .
Hazardous decomposition products:	Oxides of sulfur.
Hazardous reactions:	Reacts with acids liberating toxic fumes.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion:	Swallowing can result in nausea, vomiting, diarrhoea, and gastrointestinal irritation.
Eye contact:	May be an eye irritant. Exposure to the dust may cause discomfort due to particulate nature. May cause physical irritation to the eyes.
Skin contact:	Contact with skin may result in irritation.
Inhalation:	Breathing in dust may result in respiratory irritation.

Long Term Effects:
No information available for the product.

Toxicological Data:

Oral LD50 (rat):	3560 mg/kg.

12. ECOLOGICAL INFORMATION

Ecotoxicity	Avoid contaminating waterways.

Aquatic toxicity:
Harmful to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Disposal methods:	Refer to Waste Management Authority. Dispose of material through a licensed waste contractor. Normally suitable for disposal at approved land waste site.

14. TRANSPORT INFORMATION

Road and Rail Transport
Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; NON-DANGEROUS GOODS.

Marine Transport
Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; NON-DANGEROUS GOODS.

Air Transport
Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; NON-DANGEROUS GOODS.

15. REGULATORY INFORMATION

Classification:	Based on available information, not classified as hazardous according to criteria of ASCC; NON-HAZARDOUS SUBSTANCE.
Poisons Schedule:	None allocated.

This material is listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

`Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinatti, 2006.

This material safety data sheet has been prepared by SH&E Shared Services, Orica.

Reason(s) for Issue:
5 Yearly Revised Primary MSDS

This MSDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

Material Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: **ZINC SULPHATE**

Other name(s): Zinc sulphate monohydrate; Zinc sulfate monohydrate; Zinc vitriol; White vitriol.

Recommended Use: Fertilizer.

Supplier: Orica Australia Pty Ltd
ABN: 004 117 828
Street Address: 1 Nicholson Street,
Melbourne 3000
Australia
Telephone Number: +61 3 9665 7111
Facsimile: +61 3 9665 7937

Emergency Telephone: **1 800 033 111 (ALL HOURS)**

2. HAZARDS IDENTIFICATION

This material is hazardous according to criteria of ASCC; HAZARDOUS SUBSTANCE.

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

Risk Phrases: Harmful if swallowed. Risk of serious damage to eyes. Very toxic to aquatic organisms. May cause long term adverse effects in the aquatic environment.

Safety Phrases: Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection.

Poisons Schedule: S6 Poison.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components / CAS Number	Proportion	Risk Phrases
Zinc sulfate 7733-02-0	>99%	R22, R41, R50/53

4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (Phone eg. Australia 131 126; New Zealand 0 800 764766) or a doctor.

Inhalation:	Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.
Skin Contact:	If skin contact occurs, remove contaminated clothing and wash skin with running water. If irritation occurs seek medical advice.
Eye Contact:	Immediately wash in and around the eye area with large amounts of water for at least 15 minutes. Eyelids to be held apart. Remove clothing if contaminated and wash skin. Urgently seek medical assistance. Transport to hospital or medical centre.
Ingestion:	Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.
Medical attention and special treatment:	Treat symptomatically. Can cause corneal burns.

5. FIRE FIGHTING MEASURES

Hazards from combustion products:	Non-combustible material.
Precautions for fire fighters and special protective equipment:	Decomposes on heating emitting toxic fumes, including those of oxides of sulfur , and oxides of zinc. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition. Keep containers cool with water spray.
Suitable Extinguishing Media:	Not combustible, however, if material is involved in a fire use: Fine water spray, normal foam, dry agent (carbon dioxide, dry chemical powder).
Hazchem Code:	2Z

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures:	If contamination of sewers or waterways has occurred advise local emergency services.
Methods and materials for containment and clean up:	Slippery when spilt. Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contact. Avoid breathing in dust. Work up wind or increase ventilation. Collect and seal in properly labelled containers or drums for disposal.

7. HANDLING AND STORAGE

This material is a Scheduled Poison S6 and must be stored, maintained and used in accordance with the relevant regulations.

Conditions for safe storage: Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from incompatible materials described in Section 10. Store away from foodstuffs. Keep containers closed when not in use - check regularly for spills.

Precautions for safe handling: Avoid skin and eye contact and breathing in dust. Keep out of reach of children.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits:
No value assigned for this specific material by the National Occupational Health and Safety Commission. However, Exposure Standard(s) for particulates:

Dusts not otherwise classified: 8hr TWA = 10 mg/m3

As published by the National Occupational Health and Safety Commission.

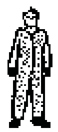
TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

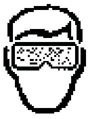
These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

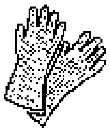
Engineering controls:
Ensure ventilation is adequate to maintain air concentrations below Exposure Standards. Avoid generating and breathing in dusts. Use with local exhaust ventilation or while wearing dust mask. Keep containers closed when not in use.

Personal Protective Equipment:
The selection of PPE is dependant on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Orica Personal Protection Guide No. 1, 1998: F - OVERALLS, SAFETY SHOES, CHEMICAL GOGGLES, GLOVES, DUST MASK.







Wear overalls, chemical goggles and impervious gloves. Avoid generating and inhaling dusts. If dust exists, wear dust mask/respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Powder
Colour:	Colourless
Odour:	Odourless
Molecular Formula:	$ZnSO_4$ (.-H_2O; .-7H_2O)
Solubility:	Soluble in water.
Specific Gravity:	1.97
Relative Vapour Density (air=1):	Not available
Vapour Pressure (20 °C):	Not available
Flash Point (°C):	Not applicable
Flammability Limits (%):	Not applicable
Autoignition Temperature (°C):	Not applicable
Melting Point/Range (°C):	100
pH:	Not available

10. STABILITY AND REACTIVITY

Chemical stability:	Stable.
Conditions to avoid:	Avoid dust generation. Avoid contact with foodstuffs.
Incompatible materials:	Incompatible with acids , and water .
Hazardous decomposition products:	Oxides of zinc. Oxides of sulfur.
Hazardous reactions:	Hazardous polymerisation will not occur.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion: Swallowing can result in nausea, vomiting, diarrhoea, and gastrointestinal irritation.

Eye contact: A severe eye irritant. Contamination of eyes can result in permanent injury.

Skin contact: Contact with skin may result in irritation.

Inhalation: Breathing in dust may result in respiratory irritation.

Long Term Effects:
No information available for the product.

Toxicological Data:

Oral LD50 (rat): 1891 mg/kg.

12. ECOLOGICAL INFORMATION

Ecotoxicity Avoid contaminating waterways.

Aquatic toxicity:
Very toxic to aquatic organisms. May cause long term adverse effects in the aquatic environment.

13. DISPOSAL CONSIDERATIONS

Disposal methods: Refer to Waste Management Authority. Dispose of material through a licensed waste contractor.

14. TRANSPORT INFORMATION

Road and Rail Transport
Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

UN No: 3077
Class-primary 9 Miscellaneous Dangerous Goods
Packing Group: III
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (ZINC SULPHATE)
Hazchem Code: 2Z

Marine Transport
Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; DANGEROUS GOODS.

UN No: 3077
Class-primary: 9 Miscellaneous Dangerous Goods
Packing Group: III
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (ZINC SULPHATE)

Air Transport
Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.

UN No:	3077
Class-primary:	9 Miscellaneous Dangerous Goods
Packing Group:	III
Proper Shipping Name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (ZINC SULPHATE)

15. REGULATORY INFORMATION

Classification: This material is hazardous according to criteria of ASCC; HAZARDOUS SUBSTANCE.

Hazard Category:
Xn: Harmful
Xi: Irritant

Risk Phrase(s):
R22: Harmful if swallowed.
R41: Risk of serious damage to eyes.

Safety Phrase(s):
S22: Do not breathe dust.
S24/25: Avoid contact with skin and eyes.
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.
S60: This material and its container must be disposed of as hazardous waste.

Poisons Schedule: S6 Poison.

This material is listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

This material safety data sheet has been prepared by SH&E Shared Services, Orica.

Reason(s) for Issue:
Revised Primary MSDS
Change in Hazardous Substance Classification

This MSDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

MATERIAL SAFETY DATA SHEET

STATEMENT OF HAZARDOUS NATURE

‘Not classified as hazardous according to criteria of Worksafe Australia’

COMPANY DETAILS

Company: Chemical & Mining Services Pty Limited
Address: Suite 101A, Level 1, 345 Pacific Highway, Lindfield NSW 2070
Telephone: 61 2 9415 6788 Facsimile: 61 2 9415 6733
24 Hour Emergency Response Service: CHEMWATCH - 1800 039 008

IDENTIFICATION

Product:	INTERFROTH®6500 (Formerly Interfroth 56)
Manufacturers’ Product Code:	IF6500
UN Number:	Not Applicable
Dangerous Goods Class, etc:	Not Applicable
Packaging Group:	Not Applicable
Hazchem Code:	Not Applicable
Poisons Schedule Number:	Not Applicable
Use:	Flotation Frother

Physical Description/Properties

Appearance:	Clear to Light Yellow Liquid
Boiling Point Range:	210 - 250°C
Specific Gravity:	1.18 @ 20°C
Flash Point:	>100°C
Solubility in Water:	0.7% (approx)
Flammability Limits:	0.78 – 7.9%
Freezing Point:	0°C
Viscosity:	14.5 cps @ 25°C

Other Properties

Ingredients

Chemical Name	Proportion
Alkyl Aryl Ester	100%

*INTERFROTH® is the registered trade name of Chemical & Mining Services Pty Limited

HEALTH HAZARD INFORMATION

Health Effects

Acute:

Toxicity:	**Low acute oral toxicity (LD_{50} rat 6.9 g/kg)**
TLV:	**5 mg/m^3**
Swallowed:	**May cause gastrointestinal irritation.**
Eye:	**Liquid will cause transient eye irritation, but permanent is unlikely.**
Skins:	**Unlikely to cause skin irritation. Prolonged contact may cause defatting.**
Inhaled:	**High concentration of vapour or mist may cause irritation to the nose, throat and mucous membranes.**

Chronic:

First Aid:

Swallowed:	**Vomiting should not be induced. Drink copious quantities of water or milk. Seek medical attention immediately.**
Eye:	**Flush immediately with water for 15 minutes. Refer residual irritation to a physician.**
Skin:	**Wash well with soap and water. Remove contaminated clothing.**
Inhalation:	**Move victim to fresh air. If exposure is severe oxygen may be needed.**

PRECAUTIONS FOR USE

Exposure Standards:	**Operate in a well ventilated area using normal protective clothing.**
Engineering Controls:	**Avoid contact with PVC, Viton and some synthetic rubbers as swelling is likely to occur. Suitable material for pump wetted areas, PVDF, Stainless Steel, EPDM and Teflon.**
Personal Protection:	**Use goggles, gloves and boots.**
Flammability:	**Flash Point is >100°C (Do not use naked flame).**

SAFE HANDLING INFORMATION

Storage and Transport: INTERFROTH®6500 should be stored in mild steel, or stainless steel tanks.

Do NOT store in PVC or Synthetic rubber vessels.

The storage area should be cool and well ventilated. The product should be protected from sources of ignition, heat or powerful oxidizing agents. Keep containers tightly closed when not in use. Avoid contact with water during storage.

The product should be handled in a well ventilated area, protective clothing, including safety glasses and gloves should be worn.

Conditions to avoid:

- Do not weld, cut, grind or drill on or near drums or bulk tanks.
- Keep well away from naked flame, incompatible materials or oxidizing agents.
- Avoid contact with PVC and synthetic rubbers.

Spills and Disposal: Small spills: Shut off all sources of ignition. Wear protective clothing, eye protection and self-contained breathing apparatus. If the spill or leak is small, a full facepiece air purifying cartridge respirator equipped for organic vapours is satisfactory. Absorb onto sand or absorbent paper and transport to the open air for eventual disposal. Wash spill site thoroughly with soap and water, and ventilate the area well.

Large spills: Contain by dyking with soil or other non-combustible sorbent material and then pump into approved waste containers; or absorb with non-combustible sorbent material and place residue in approved waste containers. Transport contaminated product and cleaning materials to a controlled site for disposal. Wash spill site with a large volume of water and allow to drain (or pump) into an approved water treatment system.

Additional Advice: Comply with all local regulations on spill reporting, handling and disposal of waste.

Fire/Explosion Hazard:

Extinguishing Media: CO_2, water spray and foam. Use water spray to cool nearby containers and structures.

Special Hazards: INTERFROTH®6500 is combustible, having a flash point of >100°C (min).

At elevated temperature in an enclosed space, ignited vapours may explode.

Protective Clothing: Fire fighters should wear self-contained breathing apparatus and full protective clothing.

OTHER INFORMATION

Environmental Precautions: Contain, prevent liquid entering sewers, water courses and rivers, basements and workpits and soil. Sewers must be covered and basements/workpits evacuated.

Discharge of high concentrations into waterways can affect aquatic life. Normal effluent from tailings dams is considered safe.

EXCLUSION OF LIABILITY

Information contained in this material safety data sheet is accurate at the date of publication to the best of the knowledge of Chemical & Mining Services Pty Limited. The company does not accept any liability whatsoever arising from the use of this information, or the use, application, adaption or processing of any products described herein.

CONTACT POINT IN CASE OF EMERGENCY:

CHEMICAL & MINING SERVICES PTY LTD
Telephone: (02) 9415 6788
Facsimile: (02) 9415 6733
Email: interfroth@interfroth.com
Web: www.interfroth.com

24 HOUR EMERGENCY RESPONSE SERVICE
CHEMWATCH: 1800 039 008

Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**DSF 802**
Recommended Use:	Frother.
Supplier:	Orica Australia Pty Ltd
ABN:	99 004 117 828
Street Address:	1 Nicholson Street, Melbourne 3000 Australia
Telephone Number:	+61 3 9665 7111
Facsimile:	+61 3 9665 7937
Emergency Telephone:	**1 800 033 111 (ALL HOURS)**

2. HAZARDS IDENTIFICATION

This material is hazardous according to criteria of Safe Work Australia; HAZARDOUS SUBSTANCE.

Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; NON-DANGEROUS GOODS.

Risk Phrases:	Irritating to eyes and skin.
Safety Phrases:	Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection.
Poisons Schedule:	None allocated.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Risk Phrases
2-Ethyl hexanol	104-76-7	10-<30%	R36/38, R52/53
Non hazardous component(s)	-	to 100%	-

4. FIRST AID MEASURES

Inhalation:
Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.

Skin Contact:
If skin or hair contact occurs, immediately remove any contaminated clothing and wash skin and hair thoroughly with running water. If swelling, redness, blistering or irritation occurs seek medical assistance.

Eye Contact:
If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre or a doctor, or for at least 15 minutes.

Ingestion:
Rinse mouth with water. If swallowed, give a glass of water to drink. If vomiting occurs give further water. Seek medical advice.

Medical attention and special treatment:
Treat symptomatically.

5. FIRE FIGHTING MEASURES

Hazards from combustion products:
Combustible liquid. On burning will emit toxic fumes, including those of oxides of carbon .

Precautions for fire fighters and special protective equipment:
Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to vapour or products of combustion.

Suitable Extinguishing Media:
Normal foam, dry agent (carbon dioxide, dry chemical powder).

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures:
Shut off all possible sources of ignition. If contamination of sewers or waterways has occurred advise local emergency services.

Methods and materials for containment and clean up:
Slippery when spilt. Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contact and breathing in vapours. Work up wind or increase ventilation. Contain - prevent run off into drains and waterways. Use absorbent (soil, sand or other inert material). Collect and seal in properly labelled containers or drums for disposal.

7. HANDLING AND STORAGE

Classified as a C1 (COMBUSTIBLE LIQUID) for the purpose of storage and handling, in accordance with the requirements of AS 1940. Refer to State Regulations for storage and transport requirements.

Conditions for safe storage:
Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from incompatible materials described in Section 10. Keep containers closed when not in use - check regularly for leaks.

Precautions for safe handling:
Avoid skin and eye contact and breathing in vapour, mists and aerosols. Take precautionary measures against static discharges.

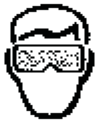
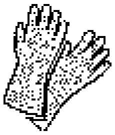
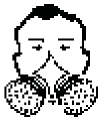
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits: No value assigned for this specific material by the National Occupational Health and Safety Commission.

Engineering controls:
Use in well ventilated areas. If inhalation risk exists: Use with local exhaust ventilation or while wearing organic vapour respirator. Keep containers closed when not in use.

Personal Protective Equipment:
The selection of PPE is dependant on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Orica Personal Protection Guide No. 1, 1998: H - OVERALLS, SAFETY SHOES, CHEMICAL GOGGLES, GLOVES, RESPIRATOR.

Wear overalls, chemical goggles and impervious gloves. Use with adequate ventilation. If risk of inhalation exists, wear organic vapour respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716.
Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

When handling this product in bulk quantities, and/or in Intermediate Bulk Containers (IBC's), wear overalls, safety shoes, impervious gloves, chemical goggles, and a face shield. If inhalation risk exists, wear appropriate respiratory protection as mentioned above.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Colour:	Dark Yellow
Odour:	Faint Specific
Solubility:	Immiscible with water.
Specific Gravity:	ca. 0.9
Relative Vapour Density (air=1):	Not available
Vapour Pressure (20 °C):	Not available
Flash Point (°C):	>70
Flammability Limits (%):	Not available
Autoignition Temperature (°C):	Not available
Boiling Point/Range (°C):	180-350
pH:	7-8

10. STABILITY AND REACTIVITY

Chemical stability:	Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Conditions to avoid:	Avoid exposure to heat, sources of ignition, and open flame.
Incompatible materials:	Incompatible with strong oxidising agents.
Hazardous decomposition products:	Oxides of carbon.
Hazardous reactions:	None known.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion:	No adverse effects expected, however, large amounts may cause nausea and vomiting.
Eye contact:	An eye irritant.
Skin contact:	Contact with skin will result in irritation. Will have a degreasing action on the skin. Repeated or prolonged skin contact may lead to irritant contact dermatitis.

Inhalation: Breathing in mists or aerosols may produce respiratory irritation.

Long Term Effects:
No information available for the product.

Toxicological Data:
Oral LD50 (rat): >2000 mg/kg (calculated)

12. ECOLOGICAL INFORMATION

Ecotoxicity Avoid contaminating waterways.

13. DISPOSAL CONSIDERATIONS

Disposal methods:
Refer to Waste Management Authority. Dispose of material through a licensed waste contractor.

14. TRANSPORT INFORMATION

Road and Rail Transport
Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; NON-DANGEROUS GOODS.

Marine Transport
Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; NON-DANGEROUS GOODS.

Air Transport
Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; NON-DANGEROUS GOODS.

15. REGULATORY INFORMATION

Classification:	This material is hazardous according to criteria of Safe Work Australia; HAZARDOUS SUBSTANCE.
Hazard Category:	Xi: Irritant
Risk Phrase(s):	R36/38: Irritating to eyes and skin.
Safety Phrase(s):	S24/25: Avoid contact with skin and eyes. S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.
Poisons Schedule:	None allocated.

All the constituents of this material are listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

16. OTHER INFORMATION

This safety data sheet has been prepared by Orica SDS Services.

Reason(s) for Issue:
5 Yearly Revised Primary SDS

This SDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

Material Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**FLOCCULANT CAKE ALSO KNOWN AS FLOCCULANT WASTE**
Recommended Use:	Waste material.
Supplier:	Orica Australia Pty Ltd
ABN:	99 004 117 828
Street Address:	1 Nicholson Street, Melbourne 3000 Australia
Telephone Number:	+61 3 9665 7111
Facsimile:	+61 3 9665 7937
Emergency Telephone:	**1 800 033 111 (ALL HOURS)**

2. HAZARDS IDENTIFICATION

Based on available information, not classified as hazardous according to criteria of Safe Work Australia; NON-HAZARDOUS SUBSTANCE.

Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; NON-DANGEROUS GOODS.

Poisons Schedule: None allocated.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Risk Phrases
Water	7732-18-5	20-40%	-
Other non-hazardous components	-	>40%	-
Ammonium nitrate	6484-52-2	5-10%	-

4. FIRST AID MEASURES

Inhalation:
Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.

Skin Contact:
If skin contact occurs, remove contaminated clothing and wash skin with running water. If irritation occurs seek medical advice. Launder contaminated clothing before reuse. Nitrates can be absorbed through cut, burnt or broken skin.

Eye Contact:
If in eyes, wash out immediately with water. In all cases of eye contamination it is a sensible precaution to seek medical advice.

Ingestion:
Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek medical advice.

Medical attention and special treatment:
Treat symptomatically. May cause methemoglobinemia. Nitrates can have a smooth muscle relaxant effect which can result in hypotension.

5. FIRE FIGHTING MEASURES

Hazards from combustion products:
Decomposes on heating emitting toxic fumes.

Precautions for fire fighters and special protective equipment:
Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition. If safe to do so, remove containers from path of fire.

Suitable Extinguishing Media:
Normal foam, dry agent (carbon dioxide, dry chemical powder).

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures:
Clear area of all unprotected personnel. Work up wind or increase ventilation. Wear protective equipment to prevent skin and eye contact. If contamination of sewers or waterways has occurred advise local emergency services.

Methods and materials for containment and clean up:
Wear protective equipment to prevent skin and eye contact. Cover with damp absorbent (inert material, sand or soil). Sweep or scoop up. Collect in properly labelled containers for disposal. Wash area down with excess water.

7. HANDLING AND STORAGE

Conditions for safe storage:
Keep containers in bunded areas. Check bunds regularly for leaks.

Precautions for safe handling:
Avoid skin and eye contact.

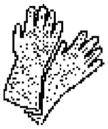
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits: No value assigned for this specific material by the National Occupational Health and Safety Commission.

Engineering controls:
Use in well ventilated areas.

Personal Protective Equipment:
The selection of PPE is dependant on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Orica Personal Protection Guide No. 1, 1998: B - OVERALLS, SAFETY SHOES, SAFETY GLASSES, GLOVES.



Wear overalls, safety glasses and impervious gloves. Always wash hands before smoking, eating, drinking or using the toilet.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Watery sludge to waxy solid cake.
Colour:	Brownish
Odour:	Slight Ammonia
Solubility:	Insoluble in water.
Specific Gravity:	0.8 - 1.1
Flash Point (°C):	N App
pH:	4 - 5

10. STABILITY AND REACTIVITY

Chemical stability:	Stable under normal conditions.
Conditions to avoid:	None known.
Incompatible materials:	Incompatible with strong alkalis.
Hazardous decomposition products:	Oxides of carbon. Oxides of nitrogen. Oxides of sulfur. Oxides of aluminium. Oxides of sodium.
Hazardous reactions:	Hazardous polymerisation will not occur.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion:	Swallowing can result in nausea, vomiting, diarrhoea, and abdominal pain. Swallowing large amounts may result in headaches, dizziness and a reduction in blood pressure (hypotension).
Eye contact:	May be an eye irritant.
Skin contact:	Contact with skin may result in irritation. The ammonium nitrate component of this material can be absorbed through burnt, cut or broken skin with resultant adverse effects.
Inhalation:	Material may be irritant to the mucous membranes of the respiratory tract (airways).

Absorption of nitrates by inhalation, ingestion or through burnt or broken skin may cause dilation of blood vessels by direct smooth muscle relaxation and may also cause methaemoglobinaemia.

Long Term Effects:
No information available for the product.

Toxicological Data: For the constituent AMMONIUM NITRATE:
Oral LD50 (rat): 2217 mg/kg
Following the ingestion of nitrates in humans and animals methaemoglobinaemia has occured.

12. ECOLOGICAL INFORMATION

Ecotoxicity	Avoid contaminating waterways.

13. DISPOSAL CONSIDERATIONS

Disposal methods:
Suitable for disposal at appropriate mine site waste or dump location. Refer to Orica site management for further details/recommendations.

14. TRANSPORT INFORMATION

Road and Rail Transport
Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; NON-DANGEROUS GOODS.

Marine Transport
Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; NON-DANGEROUS GOODS.

Air Transport
Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; NON-DANGEROUS GOODS.

15. REGULATORY INFORMATION

Classification:	Based on available information, not classified as hazardous according to criteria of Safe Work Australia; NON-HAZARDOUS SUBSTANCE.
Poisons Schedule:	None allocated.

16. OTHER INFORMATION

`Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinatti, 2009.

This material safety data sheet has been prepared by SH&E Shared Services, Orica.

Reason(s) for Issue:
Revised Primary MSDS

This MSDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

Material Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**HYDROCHLORIC ACID 33%**
Recommended Use:	Precursor for generation of chlorine dioxide gas used in water treatment.
Supplier:	Orica Australia Pty Ltd
ABN:	99 004 117 828
Street Address:	1 Nicholson Street, Melbourne 3000 Australia
Telephone Number:	+61 3 9665 7111
Facsimile:	+61 3 9665 7937
Emergency Telephone:	**1 800 033 111 (ALL HOURS)**

2. HAZARDS IDENTIFICATION

This material is hazardous according to criteria of Safe Work Australia; HAZARDOUS SUBSTANCE.

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

Risk Phrases:	Causes burns. Irritating to respiratory system. Risk of serious damage to eyes.
Safety Phrases:	Keep container in a well ventilated place. Do not breathe vapour. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible).
Poisons Schedule:	S6 Poison.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Risk Phrases
Hydrochloric acid	-	>=20%	R34 R37 R41
Non hazardous component(s)	-	to 100%	-

4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (e.g. phone Australia 131 126; New Zealand 0800 764 766) or a doctor.

Inhalation:
Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.

Skin Contact:
If spilt on large areas of skin or hair, immediately drench with running water and remove clothing. Continue to wash skin and hair with plenty of water (and soap if material is insoluble) until advised to stop by the Poisons Information Centre or a doctor.

Eye Contact:
If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. Continue to wash with large amounts of water until medical help is available.

Ingestion:
Immediately rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.

Medical attention and special treatment:
Treat symptomatically. Can cause corneal burns.

5. FIRE FIGHTING MEASURES

Hazards from combustion products:
Non-combustible material.

Precautions for fire fighters and special protective equipment:
Decomposes on heating emitting toxic fumes. If safe to do so, remove containers from path of fire. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition.

Suitable Extinguishing Media:
Not combustible, however, if material is involved in a fire use: Fine water spray, normal foam, dry agent (carbon dioxide, dry chemical powder).

Hazchem Code: 2R

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures:
Clear area of all unprotected personnel. If contamination of sewers or waterways has occurred advise local emergency services.

Methods and materials for containment and clean up:
Slippery when spilt. Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contact and breathing in vapours. Work up wind or increase ventilation. Contain - prevent run off into drains and waterways. Use absorbent (soil, sand or other inert material). Neutralise with lime or soda ash. Collect and seal in properly labelled containers or drums for disposal. Wash area down with excess water.

7. HANDLING AND STORAGE

This material is a Scheduled Poison S6 and must be stored, maintained and used in accordance with the relevant regulations.

Conditions for safe storage:
Store in cool place and out of direct sunlight. Store away from incompatible materials described in Section 10. Store away from foodstuffs. Keep containers closed when not in use - check regularly for leaks.

Precautions for safe handling:
Avoid skin and eye contact and breathing in vapour, mists and aerosols. Keep out of reach of children.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits: No value assigned for this specific material by the National Occupational Health and Safety Commission. However, Exposure Standard(s) for constituent(s):

Hydrogen chloride: Peak Limitation = 7.5 mg/m^3 (5 ppm)

As published by the National Occupational Health and Safety Commission.

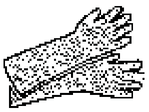
Peak Limitation - a ceiling concentration which should not be exceeded over a measurement period which should be as short as possible but not exceeding 15 minutes.

These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Engineering controls:
Ensure ventilation is adequate and that air concentrations of components are controlled below quoted Exposure Standards. If inhalation risk exists: Use with local exhaust ventilation or while wearing suitable mist respirator. Keep containers closed when not in use.

Personal Protective Equipment:
The selection of PPE is dependant on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Orica Personal Protection Guide No. 1, 1998: J - OVERALLS, RUBBER BOOTS, AIR MASK , GLOVES (Long), APRON.
* Not required if wearing air supplied mask.


Wear overalls, full face shield, elbow-length impervious gloves, splash apron and rubber boots. Use with adequate ventilation. If inhalation risk exists, wear air-supplied mask meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Clear Liquid
Colour:	Colourless to Slightly Yellow
Odour:	Pungent
Solubility:	Miscible with water.
Specific Gravity:	1.14 @ 20°C (for 28% concentration)
Relative Vapour Density (air=1):	Not available
Vapour Pressure (20 °C):	Not available
Flash Point (°C):	Not applicable
Flammability Limits (%):	Not applicable
Autoignition Temperature (°C):	Not applicable
Boiling Point/Range (°C):	98 (for 28% concentration)
pH:	ca. 1

10. STABILITY AND REACTIVITY

Chemical stability:	Corrosive to many metals with the liberation of extremely flammable hydrogen gas.
Conditions to avoid:	Avoid contact with foodstuffs.
Incompatible materials:	Incompatible with alkalis , oxidising agents , sodium hypochlorite , cyanides , and many metals .
Hazardous decomposition products:	Hydrogen chloride.
Hazardous reactions:	Reacts violently with alkalis . Reacts with oxidising agents and sodium hypochlorite liberating toxic chlorine gas.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion:	Swallowing can result in nausea, vomiting, diarrhoea, abdominal pain and chemical burns to the gastrointestinal tract.
Eye contact:	A severe eye irritant. Corrosive to eyes; contact can cause corneal burns. Contamination of eyes can result in permanent injury.
Skin contact:	Contact with skin will result in severe irritation. Corrosive to skin - may cause skin burns.
Inhalation:	Breathing in mists or aerosols will produce respiratory irritation.

Long Term Effects:
Repeated exposure to low levels of hydrochloric acid may produce discolouration and erosion of teeth and ulceration of the nasal passages.

Toxicological Data: No LD50 data available for the product. However, for constituent(s) HYDROGEN CHLORIDE:
Oral LD50 (rat): >900 mg/kg.
Inhalation LC50 (rat): 3124 ppm/1h.

12. ECOLOGICAL INFORMATION

Ecotoxicity	Avoid contaminating waterways.

13. DISPOSAL CONSIDERATIONS

Disposal methods:
Refer to Waste Management Authority. Dispose of material through a licensed waste contractor. Decontamination and destruction of containers should be considered.

14. TRANSPORT INFORMATION

Road and Rail Transport
Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

UN No:	1789
Class-primary	8 Corrosive
Packing Group:	II
Proper Shipping Name:	HYDROCHLORIC ACID
Hazchem Code:	2R

Marine Transport
Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; DANGEROUS GOODS.

UN No:	1789
Class-primary:	8 Corrosive
Packing Group:	II
Proper Shipping Name:	HYDROCHLORIC ACID

Air Transport
Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.

UN No:	1789
Class-primary:	8 Corrosive
Packing Group:	II
Proper Shipping Name:	HYDROCHLORIC ACID

15. REGULATORY INFORMATION

Classification:	This material is hazardous according to criteria of Safe Work Australia; HAZARDOUS SUBSTANCE.
Hazard Category:	C: Corrosive
Risk Phrase(s):	R34: Causes burns. R37: Irritating to respiratory system. R41: Risk of serious damage to eyes.
Safety Phrase(s):	S9: Keep container in a well ventilated place. S23: Do not breathe vapour/mist/aerosol. S24/25: Avoid contact with skin and eyes. S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37/39: Wear suitable protective clothing, gloves and eye/face protection. S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible).
Poisons Schedule:	S6 Poison.

All the constituents of this material are listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

`Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinatti, 2008.

This material safety data sheet has been prepared by SH&E Shared Services, Orica.

Reason(s) for Issue:
5 Yearly Revised Primary MSDS

This MSDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

Material Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**LIME**
Other name(s):	Calcium oxide; Quicklime; Burnt lime; Unslaked lime; Fluxing lime; Calx.
Recommended Use:	Raw material.
Supplier:	Orica Australia Pty Ltd
ABN:	99 004 117 828
Street Address:	1 Nicholson Street, Melbourne 3000 Australia
Telephone Number:	+61 3 9665 7111
Facsimile:	+61 3 9665 7937
Emergency Telephone:	**1 800 033 111 (ALL HOURS)**

2. HAZARDS IDENTIFICATION

This material is hazardous according to criteria of ASCC; HAZARDOUS SUBSTANCE.

Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; NON-DANGEROUS GOODS.

Risk Phrases:	Causes burns. Risk of serious damage to eyes.
Safety Phrases:	Do not breathe dust. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection.
Poisons Schedule:	None allocated.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Risk Phrases
Calcium oxide	1305-78-8	100%	R34 R41

4. FIRST AID MEASURES

Inhalation:
Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.

Skin Contact:
If spilt on large areas of skin or hair, immediately drench with running water and remove clothing. Continue to wash skin and hair with plenty of water (and soap if material is insoluble) until advised to stop by the Poisons Information Centre or a doctor.

Eye Contact:
Immediately wash in and around the eye area with large amounts of water for at least 15 minutes. Eyelids to be held apart. Remove clothing if contaminated and wash skin. Urgently seek medical assistance. Transport to hospital or medical centre. Continue to wash with large amounts of water until medical help is available.

Ingestion:
Immediately rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Get to a doctor or hospital quickly.

Medical attention and special treatment:
Treat symptomatically. Can cause corneal burns. Material is strongly alkaline and corrosive.

5. FIRE FIGHTING MEASURES

Hazards from combustion products:
Corrosive substance. Non-combustible material.

Precautions for fire fighters and special protective equipment:
Non-combustible material. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition.

Suitable Extinguishing Media:
Not combustible, however, if material is involved in a fire use: Normal foam, dry agent (carbon dioxide, dry chemical powder).

Hazchem Code: 2X

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures:
Clear area of all unprotected personnel. Wear protective equipment to prevent skin and eye contact. Avoid breathing in dust. Work up wind or increase ventilation.

Methods and materials for containment and clean up:
Sweep up, but avoid generating dust. Collect and seal in properly labelled containers or drums for disposal. Wash area down with excess water. Caution - heat may be evolved on contact with water.

7. HANDLING AND STORAGE

Conditions for safe storage:
Store away from incompatible materials described in Section 10. Keep dry - reacts with water, may lead to drum rupture. Store away from acids. Keep containers closed when not in use - check regularly for spills.

Precautions for safe handling:
Avoid skin and eye contact and breathing in dust.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Calcium oxide: 8hr TWA = 2 mg/m^3

As published by the National Occupational Health and Safety Commission.

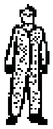
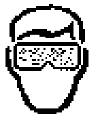
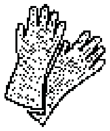
TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Engineering controls:
Ensure ventilation is adequate to maintain air concentrations below Exposure Standards. Keep containers closed when not in use.

Personal Protective Equipment:
The selection of PPE is dependant on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Orica Personal Protection Guide No. 1, 1998: F - OVERALLS, SAFETY SHOES, CHEMICAL GOGGLES, GLOVES, DUST MASK.


Wear overalls, chemical goggles and impervious gloves. Avoid generating and inhaling dusts. If dust exists, wear dust mask/respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Solid
Colour:	White to Grey
Odour:	Odourless
Molecular Formula:	CaO
Solubility:	Reacts with water. Soluble in acids
Specific Gravity:	3.4
Flash Point (°C):	N App
Solubility in water (g/L):	Reacts
Melting Point/Range (°C):	2570
Boiling Point/Range (°C):	2850
Decomposition Point (°C):	N Av
pH:	12.5 (saturated solution)

10. STABILITY AND REACTIVITY

Chemical stability:	Crumbles on exposure to air. Readily absorbs carbon dioxide and moisture from air. Reacts with water to form calcium hydroxide with evolution of heat. Reacts with acids .
Conditions to avoid:	Avoid exposure to air. Avoid contact with acids . Avoid exposure to moisture.
Incompatible materials:	Incompatible with acids. Incompatible with moisture. Incompatible with water. Incompatible with aluminium .
Hazardous decomposition products:	Oxides of calcium.
Hazardous reactions:	Hazardous polymerisation will not occur. Reacts exothermically on dilution with water. Reacts exothermically with acids . Becomes incandescent when heated near its boiling point.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion:	Swallowing can result in nausea, vomiting, diarrhoea, abdominal pain and chemical burns to the gastrointestinal tract.
Eye contact:	A severe eye irritant. Corrosive to eyes; contact can cause corneal burns. Contamination of eyes can result in permanent injury.
Skin contact:	Contact with skin will result in severe irritation. Corrosive to skin - may cause skin burns.
Inhalation:	Material is irritant to the mucous membranes of the respiratory tract (airways). Inflammation of the respiratory passages, ulceration and perforation of the nasal septum, and pneumonia have been attributed to inhalation of calcium oxide dust; severe irritation of the upper respiratory tract usually causes people to avoid extreme exposure.

Long Term Effects:
No information available for the product.

Toxicological Data: No LD50 data available for the product.

12. ECOLOGICAL INFORMATION

Ecotoxicity	Avoid contaminating waterways.

13. DISPOSAL CONSIDERATIONS

Disposal methods:
Refer to Waste Management Authority. Normally suitable for disposal at approved land waste site. Decontamination and destruction of containers should be considered. Clean containers with water. Use large volume of water - material reacts with water with the evolution of heat.

14. TRANSPORT INFORMATION

Road and Rail Transport
Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; NON-DANGEROUS GOODS.

Hazchem Code:	2X

Marine Transport
Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; NON-DANGEROUS GOODS.

Air Transport
Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.

UN No:	1910
Class-primary:	8 Corrosive
Packing Group:	III
Proper Shipping Name:	CALCIUM OXIDE

15. REGULATORY INFORMATION

Classification:	This material is hazardous according to criteria of ASCC; HAZARDOUS SUBSTANCE.
Hazard Category:	C: Corrosive
Risk Phrase(s):	R34: Causes burns. R41: Risk of serious damage to eyes.
Safety Phrase(s):	S22: Do not breathe dust. S24/25: Avoid contact with skin and eyes. S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.
Poisons Schedule:	None allocated.

This material is listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

This material safety data sheet has been prepared by SH&E Shared Services, Orica.

Reason(s) for Issue:
5 Yearly Revised Primary MSDS

This MSDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**SIPX**
Other name(s):	Sodium isopropyl xanthate; Carbonodithioic acid, O-isopropyl ester, sodium salt.
Recommended Use:	Mineral floatation.
Supplier:	Orica Australia Pty Ltd
ABN:	99 004 117 828
Street Address:	1 Nicholson Street, Melbourne 3000 Australia
Telephone Number:	+61 3 9665 7111
Facsimile:	+61 3 9665 7937
Emergency Telephone:	**1 800 033 111 (ALL HOURS)**

2. HAZARDS IDENTIFICATION

This material is hazardous according to criteria of Safe Work Australia; HAZARDOUS SUBSTANCE.

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

Risk Phrases:	Harmful if swallowed. Irritating to skin. Toxic to aquatic organisms. May cause long term adverse effects in the aquatic environment.
Safety Phrases:	Do not breathe dust. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection.
Poisons Schedule:	None allocated.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Risk Phrases
Sodium isopropyl xanthate	140-93-2	>=90%	R22, R38, R51/53

4. FIRST AID MEASURES

Inhalation:
Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.

Skin Contact:
If skin or hair contact occurs, immediately remove any contaminated clothing and wash skin and hair thoroughly with running water. If swelling, redness, blistering or irritation occurs seek medical assistance.

Eye Contact:
If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre or a doctor, or for at least 15 minutes.

Ingestion:
Rinse mouth with water. If swallowed, give a glass of water to drink. If vomiting occurs give further water. Seek immediate medical assistance.

Medical attention and special treatment:
Treat symptomatically.

5. FIRE FIGHTING MEASURES

Hazards from combustion products:
Substance liable to spontaneous combustion.

Precautions for fire fighters and special protective equipment:
Heating can cause expansion or decomposition of the material, which can lead to the containers exploding. If safe to do so, remove containers from the path of fire. Decomposes on heating emitting toxic fumes, including those of hydrogen sulfide , and carbon disulfide . Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition.

Suitable Extinguishing Media:
Coarse water spray, fine water spray, normal foam, dry agent (carbon dioxide, dry chemical powder).

Hazchem Code: 1Y

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures:
Shut off all possible sources of ignition. Clear area of all unprotected personnel. If contamination of sewers or waterways has occurred advise local emergency services.

Methods and materials for containment and clean up:
Wear protective equipment to prevent skin and eye contact and breathing in vapours/dust. DO NOT allow material to get wet. Air-supplied masks are recommended to avoid inhalation of toxic material. Vacuum solid spills instead of sweeping. Collect and seal in properly labelled containers or drums for disposal.

7. HANDLING AND STORAGE

Conditions for safe storage:
Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from sources of heat or ignition. Store away from foodstuffs. Store away from incompatible materials described in Section 10. Keep dry - reacts with water, may lead to drum rupture. Keep containers closed when not in use - check regularly for spills.

Precautions for safe handling:
Avoid skin and eye contact and breathing in dust. In common with many organic chemicals, may form flammable dust clouds in air. For precautions necessary refer to Safety Data Sheet "Dust Explosion Hazards".

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits: No value assigned for this specific material by the National Occupational Health and Safety Commission. However, supplier recommended Exposure Standard(s):

TWA = 5 ppm (skin)

However, Exposure Standard(s) for decomposition product(s):

Carbon disulfide: 8hr TWA = 31 mg/m^3 (10 ppm), Sk
Hydrogen sulfide: 8hr TWA = 14 mg/m^3 (10 ppm), 15 min STEL 21 mg/m^3 (15 ppm)

As published by the National Occupational Health and Safety Commission.

TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

STEL (Short Term Exposure Limit) - the average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight hour work day. According to current knowledge this concentration should neither impair the health of, nor cause undue discomfort to, nearly all workers.

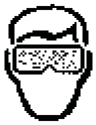
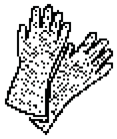
`Sk' Notice - absorption through the skin may be a significant source of exposure. The exposure standard is invalidated if such contact should occur.

These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Engineering controls:
Ensure ventilation is adequate and that air concentrations of components are controlled below quoted Exposure Standards. Avoid generating and breathing in dusts. Use with local exhaust ventilation or while wearing dust mask. Keep containers closed when not in use.

Personal Protective Equipment:
The selection of PPE is dependant on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Orica Personal Protection Guide No. 1, 1998: F - OVERALLS, SAFETY SHOES, CHEMICAL GOGGLES, GLOVES, DUST MASK.


Wear overalls, chemical goggles and impervious gloves. Avoid generating and inhaling dusts. If dust exists, wear dust mask/respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Powder or Pellets
Colour:	Yellow
Odour:	Slight Characteristic
Molecular Formula:	(CH3)2CH-O-(C=S)S.Na
Solubility:	Soluble in water.
Specific Gravity:	ca. 0.8
Relative Vapour Density (air=1):	Not available
Vapour Pressure (20 °C):	Not available

9. PHYSICAL AND CHEMICAL PROPERTIES

Flash Point (°C):	Not available
Flammability Limits (%):	1.25-50 (for carbon disulfide gas)
Autoignition Temperature (°C):	Not available
Melting Point/Range (°C):	150-250
pH:	>12

10. STABILITY AND REACTIVITY

Chemical stability:	No information available.
Conditions to avoid:	Avoid exposure to moisture. Avoid exposure to heat.
Incompatible materials:	Incompatible with acids , oxidising agents , and moisture .
Hazardous decomposition products:	Carbon disulfide. Hydrogen sulfide.
Hazardous reactions:	Reacts exothermically with water .

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion:	Swallowing may result in irritation of the gastrointestinal tract.
Eye contact:	May be an eye irritant. Exposure to the dust may cause discomfort due to particulate nature. May cause physical irritation to the eyes.
Skin contact:	Contact with skin will result in irritation. Will liberate carbon disulfide upon contact with moist skin. Carbon disulfide can be absorbed through the skin with resultant adverse effects.
Inhalation:	Breathing in dust may result in respiratory irritation. May cause coughing and shortness of breath.

Long Term Effects:
No information available for the product.

Toxicological Data:
Oral LD50 (rat): 1500 mg/kg.

12. ECOLOGICAL INFORMATION

Ecotoxicity	Avoid contaminating waterways.
Aquatic toxicity:	Toxic to aquatic organisms. May cause long term adverse effects in the aquatic environment.

13. DISPOSAL CONSIDERATIONS

Disposal methods:
Refer to Waste Management Authority. Advise flammable nature. Dispose of material through a licensed waste contractor.

14. TRANSPORT INFORMATION

Road and Rail Transport
Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

UN No:	3342
Class-primary	4.2 Spontaneously Combustible
Packing Group:	II
Proper Shipping Name:	XANTHATES
Hazchem Code:	1Y

Marine Transport
Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; DANGEROUS GOODS.

UN No:	3342
Class-primary:	4.2 Spontaneously Combustible
Packing Group:	II
Proper Shipping Name:	XANTHATES
IMDG EMS Fire:	F-A
IMDG EMS Spill:	S-J

Air Transport
Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.

UN No:	3342
Class-primary:	4.2 Spontaneously Combustible
Packing Group:	II
Proper Shipping Name:	XANTHATES

15. REGULATORY INFORMATION

Classification:	This material is hazardous according to criteria of Safe Work Australia; HAZARDOUS SUBSTANCE.
Hazard Category:	Xn: Harmful Xi: Irritant
Risk Phrase(s):	R22: Harmful if swallowed. R38: Irritating to skin.
Safety Phrase(s):	S22: Do not breathe dust. S24/25: Avoid contact with skin and eyes. S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.

Poisons Schedule: None allocated.

This material is listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

This safety data sheet has been prepared by SH&E Shared Services, Orica.

Reason(s) for Issue:
5 Yearly Revised Primary SDS
Change in Hazardous Substance Classification

This SDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

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Brenntag Canada Inc. **BRENNTAG**

MATERIAL SAFETY DATA SHEET

POTASSIUM AMYL XANTHATE, SOLID

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Brenntag Canada Inc.
43 Jutland Rd.
Toronto, ON
M8Z 2G6
(416) 259-8231

Website: http:\\www.brenntag.ca

WHMIS#:	00060600
Index:	HCI0065/09B
Effective Date:	2009 June 17
Date of Revision:	2009 June 17

EMERGENCY TELEPHONE NUMBERS (FOR EMERGENCIES INVOLVING CHEMICAL SPILLS OR RELEASE)

Toronto, ON (416) 226-6117	Montreal, QC (514) 861-1211	Winnipeg, MB (204) 943-8827
Edmonton, AB (780) 424-1754	Calgary, AB (403) 263-8660	Vancouver, BC (604) 685-5036

PRODUCT IDENTIFICATION

Product Name:	Potassium Amyl Xanthate, Solid.
Chemical Name:	Dithiocarbonic Acid, Amyl Ester, Potassium Salt.
Synonyms:	Potassium Amyl Xanthate; KAX 51; Potassium Pentyl Xanthate; Potassium Pentyl Xanthogenate.
Chemical Family:	Salts of carbonic acid dithio esters.
Molecular Formula:	C6H11OS2. K.
Product Use:	Flotation agent.

WHMIS Classification / Symbol:

B-6: Reactive Flammable Material
D-1B: Toxic (acute effects)
D-2B: Toxic (skin and eye irritant)

READ THE ENTIRE MSDS FOR THE COMPLETE HAZARD EVALUATION OF THIS PRODUCT.

2. COMPOSITION, INFORMATION ON INGREDIENTS (Not Intended As Specifications)

Ingredient	*CAS#*	*ACGIH TLV*	*% Concentration*
Potassium Amyl Xanthate	2720-73-2	---	60 - 100
Potassium Hydroxide	1310-58-3	—	1 - 5
Isoamyl alcohol	123-51-3	100 ppm	1 - 5
Decomposition Product: Carbon disulfide	75-15-0	10 ppm (Skin)	

Skin Notation: Contact with skin, eyes and mucous membranes can contribute to the overall exposure and may invalidate the TLV. Consider measures to prevent absorption by these routes.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: May be fatal if swallowed. Harmful if inhaled. Causes skin and eye irritation. Dust is irritating to respiratory tract. See "Other Health Effects" Section. Heating of solid xanthate or aging or heating of solutions will cause formation of Carbon Bisulfide. Upon exposure of solid xanthates to moisture and/or heat, decomposition results and spontaneous combustion can occur. Contact of solid xanthate with moist air has resulted in ignition. (4) Emits a flammable gas upon contact with water or water vapour. Can decompose at high temperatures forming toxic gases. Powdered material may form explosive dust-air mixtures. Contents may develop pressure on prolonged exposure to heat.

POTENTIAL HEALTH EFFECTS

Inhalation:	Excessive contact with powder may cause drying of mucous membranes of nose and throat due to absorption of moisture and oils. Product may cause severe irritation of the nose, throat and respiratory tract. Repeated and/or prolonged exposures may cause productive cough, running nose, bronchopneumonia, pulmonary oedema (fluid build-up in lungs), and reduction of pulmonary function. Irritation of mucous membranes and respiratory tract is possible following exposure to the decomposition product. (3) See "Other Health Effects" Section.
Skin Contact:	Brief contact with the dust causes irritation. Greater exposure causes severe burns. In the presence of moisture (perspiration, humidity, tears), the dust dissolves to form a corrosive solution which may cause burns. (3) Potassium Amyl Xanthate may cause symptoms of skin irritation such as reddening, swelling, rash, scaling, or blistering. May cause defatting, drying and cracking of the skin.
Skin Absorption:	May be absorbed through intact skin. See Section 11, "Other Studies Relevant to Material".
Eye Contact:	This product may cause irritation, redness and possible damage due to abrasiveness. Brief contact with the dust causes irritation. Greater exposure causes severe burns. In the presence of moisture (perspiration, humidity, tears), the dust dissolves to form a corrosive solution which may cause burns. (3) Irritation of the eyes is possible following exposure to the decomposition product. (3)
Ingestion:	Ingestion is not a likely route of exposure. This product causes irritation, a burning sensation of the mouth and throat and abdominal pain.
Other Health Effects:	Effects (irritancy) on the skin and eyes may be delayed, and damage may occur without the sensation or onset of pain. Strict adherence to first aid measures following any exposure is essential. May cause cardiovascular effects, liver damage, peripheral nervous system (PNS) effects or central nervous system (CNS) depression. CNS depression is characterized by headache, dizziness, drowsiness, nausea, vomiting and incoordination. Severe overexposures may lead to coma and possible death due to respiratory failure. Peripheral Neuropathy is a progressive disorder of the nervous system characterized by sensory and motor abnormalities, muscle spasms, weakness and pain in the arms and legs, numbness and tingling of the fingers and toes and paralysis. Liver damage is characterized by the loss of appetite, jaundice (yellowish skin colour), and occasional pain in the upper left-hand side of the abdomen. Potassium Amyl Xanthate: Symptoms of potassium poisoning may occur. These include slow heartbeat, accelerated breathing, muscle weakness and, in severe cases, paralysis. Vapours of the decomposition products of Xanthates (Carbon Bisulphide) can cause severe disturbances of mood and behaviour, including excitation, anger and violent dreams. High concentrations of vapours can cause death. (4) Carbon Bisulphide: Contact with moisture in the body by inhalation may yield sodium hydroxide (corrosive) and 2-mercaptobenzothiazole, an irritant. (4) Contact with acids will liberate carbon disulphide. (3) Exposure to carbon disulphide (500 to 1000 ppm) may cause severe mood and personality disturbances, including excitability, confusion, irritability, uncontrollable anger, bizarre dreams, insomnia, psychosis and suicide. Exposure to carbon disulphide at 4800 ppm for thirty minutes results in coma and may be fatal. Carbon disulphide is readily absorbed through intact skin. Chronic exposure to carbon disulphide produces central and peripheral nervous system, cardiovascular, gastrointestinal, kidney, endocrine and eye disorders. (4) Potassium Hydroxide: Exposure to very low doses, even for a short period of time, has produced extensive damage to the esophagus, stomach and intestine extending into surrounding tissues, as well as hyperexcitability followed by apathy and weakness. In some cases, death has resulted from hemorrhage, adhesions or perforation. Following esophageal damage, strictures have frequently developed in surviving animals. (4)

4. FIRST AID MEASURES

FIRST AID PROCEDURES

Inhalation:	Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical advice IMMEDIATELY.
Skin Contact:	Prompt removal of the material from the skin is essential. Remove all contaminated clothing and immediately wash the exposed areas with copious amounts of soap and water for a minimum of 30 minutes or up to 60 minutes for critical body areas. Immerse the exposed part immediately in ice water to relieve pain and to prevent swelling and blistering. Place cold packs, ice or wet cloths on the burned area if immersion is not possible. Cover the exposed part with a clean, preferably sterile, lint-free dressing. Obtain medical attention IMMEDIATELY and monitor breathing and treat for shock for severe exposure.
Eye Contact:	Immediately flush eyes with running water for a minimum of 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY.

Ingestion:	Do not attempt to give anything by mouth to an unconscious person. If victim is alert and not convulsing, rinse mouth out and give 1/2 to 1 glass of water to dilute material. IMMEDIATELY contact local Poison Control Centre. Vomiting should only be induced under the direction of a physician or a poison control centre. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility.
Note to Physicians:	Treat symptomatically. Medical conditions that may be aggravated by exposure to this product include neurological and cardiovascular disorders, diseases of the skin, eyes or respiratory tract, preexisting liver and kidney disorders.

5. FIRE-FIGHTING MEASURES

Flashpoint (°C)	*AutoIgnition Temperature (°C)*	**Flammability Limits in Air (%):** *LEL*	*UEL*
-30. (Carbon Disulphide)	90.1 (Carbon Disulphide)	1.25. (Carbon Disulphide)	50. (Carbon Disulphide)

Flammability Class (WHMIS):	B-6: Reactive Flammable Material
Hazardous Combustion Products:	Thermal decomposition products are toxic and may include Carbon Disulphide, Potassium sulphide, carbonyl sulphide, Amyl Alcohols, oxides of carbon, sulphur, potassium and irritating gases.
Unusual Fire or Explosion Hazards:	This product may be capable of forming flammable dust clouds in air. Avoid accumulation and dispersion of dust to reduce explosion potential. Spilled material may cause floors and contact surfaces to become slippery. Heating of solid xanthate or aging or heating of solutions will cause formation of Carbon Bisulfide. Upon exposure of solid xanthates to moisture and/or heat, decomposition results and spontaneous combustion can occur. Contact of solid xanthate with moist air has resulted in ignition. (4) Vapours from this product are heavier than air, and may "travel" to a source of ignition (eg. pilot lights, heaters, electric motors) some distance away, and then "flash back" to the point of product discharge causing an explosion and fire. Enforce NO SMOKING rules.
Sensitivity to Mechanical Impact:	Not expected to be sensitive to mechanical impact.
Rate of Burning:	Not available.
Explosive Power:	Not available.
Sensitivity to Static Discharge:	If product has come into contact with moisture and Carbon Bisulphide gas has evolved, then Carbon Bisulphide is expected to be sensitive to static discharge if vapours are present between the lower and upper explosive limits. (3) High voltage static electricity build-up is possible when significant quantities of dust are present.
EXTINGUISHING MEDIA	
Fire Extinguishing Media:	Use carbon dioxide or dry chemical media for small fires. If only water is available, use it in the form of a fog. Cool containers with flooding quantities of water until well after the fire is out. Exposure to heat and moisture may cause the decomposition of xanthates to release flammable, explosive and poisonous Carbon Bisulphide vapours. (3)
FIRE FIGHTING INSTRUCTIONS	
Instructions to the Fire Fighters:	Use water spray to cool fire-exposed containers or structures. Use water spray to disperse vapours; re-ignition is possible. Clean up immediately to eliminate slipping hazard. Do not allow to enter sewers or watercourses. Avoid accumulation and dispersion of dust to reduce explosion potential.
Fire Fighting Protective Equipment:	Use self-contained breathing apparatus and protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Information in this section is for responding to spills, leaks or releases in order to prevent or minimize the adverse effects on persons, property and the environment. There may be specific reporting requirements associated with spills, leaks or releases, which change from region to region.

Containment and Clean-Up Procedures:	In all cases of leak or spill contact vendor at Emergency Number shown on the front page of this MSDS. Avoid accumulation and dispersion of dust to reduce explosion potential. Wear respirator, protective clothing and gloves. Spilled material may cause floors and contact surfaces to become slippery. Any recovered product can be used for the usual purpose, depending on the extent and kind of contamination. Where a package (drum or bag) is damaged and / or leaking, repair it, or place it into an over-pack drum immediately so as to avoid or minimize material loss and contamination of surrounding environment. Replace damaged containers immediately to avoid loss of material and contamination of surrounding atmosphere. Avoid dry sweeping. Do not use compressed air to clean surfaces. Vacuuming or wet sweeping is preferred. Return all material possible to container for proper disposal. Do not flush with water as aqueous solutions or powders that become wet render surfaces extremely slippery. Eliminate all sources of ignition. Collect product for recovery or disposal. For release to land, or storm water runoff, contain discharge by constructing dykes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Ventilate enclosed spaces. Notify applicable government authority if release is reportable or could adversely affect the environment.

7. HANDLING AND STORAGE

HANDLING

Handling Practices:	Avoid accumulation and dispersion of dust to reduce explosion potential. Ground and bond equipment and containers to prevent a static charge buildup. Use spark-resistant tools. Use normal "good" industrial hygiene and housekeeping practices. Clean up immediately to eliminate slipping hazard. Enforce NO SMOKING rules in area of use.
Ventilation Requirements:	See Section 8, "Engineering Controls".
Other Precautions:	Use only with adequate ventilation and avoid breathing dusts (aerosols, vapours or mists). Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use. Do not use cutting or welding torches on empty drums that contained this material/product. Absorption via contact with skin, eyes and mucous membranes can contribute to the overall exposure. Consider measures to prevent absorption by these routes.

STORAGE

Storage Temperature (°C):	See below.
Ventilation Requirements:	Ventilation should be explosion proof.
Storage Requirements:	Store solid Xanthates under cool, dark, dry conditions. Liquid products must be kept cool and used as quickly as possible. (3) Store in a cool, well-ventilated area. Keep away from heat, sparks and flames. Keep containers closed. Do not expose sealed containers to temperatures above 40° C. Avoid moisture contamination. Prolonged storage may result in lumping or caking.
Special Materials to be Used for Packaging or Containers:	Materials of construction for storing the product include: carbon steel. Copper and its alloys should not be used in equipment for storage, handling or transportation. Attacks some types of rubber, plastics and coatings. Confirm suitability of any material before using.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Recommendations listed in this section indicate the type of equipment, which will provide protection against overexposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

ENGINEERING CONTROLS

Engineering Controls:	Local exhaust ventilation required. Ventilation should be explosion proof. Make up air should be supplied to balance air that is removed by local or general exhaust ventilation. Avoid accumulation and dispersion of dust to reduce explosion potential. Ventilate low lying areas such as sumps or pits where dense dust may collect. Enforce NO SMOKING rules.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Eye Protection:	Use chemical safety goggles when there is potential for eye contact. Use full face-shield and chemical safety goggles when there is potential for contact.
Skin Protection:	Gloves and protective clothing made from neoprene, PVC, polyethylene, rubber or plastic should be impervious under conditions of use. Attacks some types of rubber, plastics and coatings. Prior to use, user should confirm impermeability. Discard contaminated gloves.
Respiratory Protection:	No specific guidelines available. A NIOSH/MSHA-approved air-purifying respirator equipped with dust, mist, fume cartridges for concentrations up to 2 mg/m³ Potassium Hydroxide. An air-supplied respirator if concentrations are higher or unknown.

Other Personal Protective Equipment:	Avoid accumulation and dispersion of dust to reduce explosion potential. Wear an impermeable apron and boots. Locate safety shower and eyewash station close to chemical handling area. Take all precautions to avoid personal contact. Clothing and footwear that is fire retardant and dissipates static electrical charges should be worn when handling flammable materials. Natural fibers (cotton, wool, leather and linen) should be selected in favour of synthetic materials (rayon, nylon and polyester). Skin Notation: Contact with skin, eyes and mucous membranes can contribute to the overall exposure and may invalidate the TLV. Consider measures to prevent absorption by these routes.

EXPOSURE GUIDELINES

SUBSTANCE	***ACGIH TLV***	***OSHA PEL***		***NIOSH REL***	
	(STEL)	***(TWA)***	***(STEL)***	***(TWA)***	***(STEL)***
Potassium Hydroxide	2 mg/m³ (Ceiling)	---	---	---	2 mg/m³ (Ceiling)
Isoamyl alcohol	125 ppm	100 ppm	---	100 ppm	125 ppm
Decomposition Product: Carbon disulfide	—	20 ppm (Skin)	30 ppm (Skin)	1 ppm (Skin)	3 ppm (Skin)

9. PHYSICAL AND CHEMICAL PROPERTIES (Not intended as Specifications)

Physical State:	Solid.
Appearance:	Yellow to yellow-green pellets.
Odour:	Strong, disagreeable sulphur odour.
Odour Threshold (ppm):	0.02 - 0.21(Carbon Disulphide)
Boiling Range (°C):	Not available.
Melting/Freezing Point (°C):	255 - 280 (decomposes). (3)
Vapour Pressure (mm Hg at 20° C):	Not applicable.
Vapour Density (Air = 1.0):	Not applicable.
Relative Density (g/cc):	0.7. (4)
Bulk Density:	Not applicable.
Viscosity:	Not applicable.
Evaporation Rate (Butyl Acetate = 1.0):	Not applicable.
Solubility:	Soluble in water. Hygroscopic (readily absorbs water).
% Volatile by Volume:	< 20. (3)
pH:	10.5 (10 % solution). (3)
Coefficient of Water/Oil Distribution:	Not available.
Volatile Organic Compounds (VOC):	Not applicable.
Flashpoint (°C):	-30. (Carbon Disulphide)

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY

Under Normal Conditions:	Unstable. Solid Xanthates are stable when kept cool and dry. Exposure to heat causes decomposition. Acids and oxidizing agents accelerate aging. In solution, Xanthates will decompose slowly even at room temperature. (3)
Under Fire Conditions:	Flammable. This product may be capable of forming flammable dust clouds in air.
Hazardous Polymerization:	Will not occur.
Conditions to Avoid:	High temperatures, sparks, open flames and all other sources of ignition. Avoid accumulation and dispersion of dust to reduce explosion potential. Exposure to heat and moisture may cause the decomposition of xanthates to release flammable, explosive and poisonous Carbon Bisulphide vapours. (3)
Materials to Avoid:	Strong oxidizers. Lewis or mineral acids. Metal Salts. Copper and its alloys.. Contact with acids will liberate Carbon Bisulphide. Avoid moisture contamination. Contact with water or moisture will liberate Carbon Bisulphide. Mixtures or reactions of alcohols with the following materials may cause explosions: barium perchlorate, chlorine, hypochlorous acid, ethylene oxide, hexamethylene diisocyanate and other isocyanates, nitrogen tetroxide, permonosulfuric acid and tri-isobutyl aluminum. (4) Attacks some types of rubber, plastics and coatings.

Decomposition or Combustion Products:	Thermal decomposition products are toxic and may include Carbon Bisulphide, Potassium sulphide, carbonyl sulphide, Amyl Alcohols, oxides of carbon, sulphur, potassium and irritating gases.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA:

SUBSTANCE	***LD50 (Oral, Rat)***	***LD50 (Dermal, Rabbit)***	***LC50 (Inhalation, Rat, 4h)***
Potassium Amyl Xanthate	1 000 mg/kg (3)	---	---
Potassium Hydroxide	214 - 365 mg/kg (1,3)	1 260 mg/kg (3)	---
Isoamyl alcohol	1 300 mg/kg (1)	3 216 mg/kg (1)	---
Decomposition Product: Carbon disulfide	1 200 mg/kg (1)	---	12 500 mg/m3 (1)

Carcinogenicity Data:	The ingredient(s) of this product is (are) not classed as carcinogenic by ACGIH, IARC, OSHA or NTP.
Reproductive Data:	This product: No adverse reproductive effects are anticipated.
Mutagenicity Data:	No adverse mutagenic effects are anticipated.
Teratogenicity Data:	No adverse teratogenic effects are anticipated.
Respiratory / Skin Sensitization Data:	None known.
Synergistic Materials:	Alcohols may interact synergistically with chlorinated solvents (example - carbon tetrachloride, chloroform, bromotrichloromethane), dithiocarbamates (example - disulfiram), dimethylnitrosamine and thioacetamide. (4) Carbon Bisulphide: The toxic effects of Carbon Bisulphide, particularly on the nervous system, can be intensified by consumption of alcohol, alcoholism, treatment with disulfiram (Antibuse), and exposure to Hydrogen Sulphide. (4) In animal studies the toxicity of Carbon Bisulphide was intensified by chemicals such as resperine and amphetamine which act on the nervous system. (4)
Other Studies Relevant to Material:	None known.

12. ECOLOGICAL INFORMATION

Ecotoxicity:	Not available. May be harmful to aquatic life.
Environmental Fate:	Not available. Product has an unaesthetic appearance and can be a nuisance. Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals:	Not available.
Waste Disposal Methods:	This information applies to the material as manufactured. Reevaluation of the product may be required by the user at the time of disposal since the product uses, transformations, mixtures and processes may influence waste classification. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems.
Safe Handling of Residues:	See "Waste Disposal Methods".
Disposal of Packaging:	Empty containers retain product residue and can be dangerous. Treat package in the same manner as the product.

14. TRANSPORTATION INFORMATION

CANADIAN TDG ACT SHIPPING DESCRIPTION:

XANTHATES, Class 4.2, UN3342, PG III.

Label(s): Substances Liable To Spontaneous Combustion. Placard: Substances Liable To Spontaneous Combustion.

ERAP Index: -----. Exemptions: None known.

US DOT CLASSIFICATION (49CFR 172.101, 172.102):

XANTHATES, Class 4.2, UN3342, PG III.

Label(s): Spontaneously Combustible. Placard: Spontaneously Combustible.

CERCLA-RQ: Not available. Exemptions: None known.

15. REGULATORY INFORMATION

CANADA

CEPA - NSNR:	All constituents of this product are included on the DSL.
CEPA - NPRI:	Not included.

Controlled Products Regulations Classification (WHMIS):

B-6: Reactive Flammable Material
D-1B: Toxic (acute effects)
D-2B: Toxic (skin and eye irritant)

USA

Environmental Protection Act:	All constituents of this product are included on the TSCA inventory.
OSHA HCS (29CFR 1910.1200):	Flammable Solid. Toxic. Skin and Eye Irritant.

NFPA: 3 Health, 4 Fire, 0 Reactivity (6)
HMIS: Health, Fire, Reactivity (Not available.)

INTERNATIONAL

Not available.

16. OTHER INFORMATION

REFERENCES

1. RTECS-Registry of Toxic Effects of Chemical Substances, Canadian Centre for Occupational Health and Safety RTECS database.
2. Clayton, G.D. and Clayton, F.E., Eds., Patty's Industrial Hygiene and Toxicology, 3rd ed., Vol. IIA,B,C, John Wiley and Sons, New York, 1981.
3. Supplier's Material Safety Data Sheet(s).
4. CHEMINFO, through "CCINFOdisc", Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada.
5. Guide to Occupational Exposure Values, 2007, American Conference of Governmental Industrial Hygienists, Cincinnati, 2007.
6. Regulatory Affairs Group, Brenntag Canada Inc.
7. The British Columbia Drug and Poison Information Centre, Poison Managements Manual, Canadian Pharmaceutical Association, Ottawa, 1981.

To obtain revised copies of this or other Material Safety Data Sheets, contact your nearest Brenntag Canada Regional office.

British Columbia: 20333-102B Avenue, Langley, BC, V1M 3H1
Phone: (604) 513-9009 Facsimile: (604) 513-9010

Alberta: 6628 - 45 th. Street, Leduc, AB, T9E 7C9
Phone: (780) 986-4544 Facsimile: (780) 986-1070

Manitoba: 681 Plinquet Street, Winnipeg, MB, R2J 2X2
Phone: (204) 233-3416 Facsimile: (204) 233-7005

Ontario: 43 Jutland Road, Toronto, ON, M8Z 2G6
Phone: (416) 259-8231 Facsimile: (416) 259-5333

Quebec: 2900 Jean Baptiste Des., Lachine, PQ, H8T 1C8
Phone: (514) 636-9230 Facsimile: (514) 636-0877

Atlantic: A-105 Akerley Boulevard, Dartmouth, NS, B3B 1R7
Phone: (902) 468-9690 Facsimile: (902) 468-3085

Prepared By: Regulatory Affairs Group, Brenntag Canada Inc., (416) 259-8231.

MATERIAL SAFETY DATA SHEET

Sodium Hexametaphosphate

Section 01 - Chemical And Product And Company Information

Product Identifier	Sodium Hexametaphosphate
Product Use	Water softening, sequestrants, emulsifiers, food additive, textile processing, laundering
Supplier Name	ClearTech Industries Inc. 2302 Hanselman Avenue Saskatoon, SK. Canada S7L 5Z3
Prepared By	ClearTech Industries Inc. Technical Department Phone: (306)664-2522
Preparation Date	March 8, 2011
24-Hour Emergency Phone	306-664-2522

Section 02 - Composition / Information on Ingredients

Hazardous Ingredients	Sodium Hexametaphosphate	100%
CAS Number	Sodium Hexametaphosphate	68915-31-1
Synonym (s)	Sodium polyphosphates, glassy; Sodaphos; Hexaphos; Glass H; glassy sodium phosphates; sodium tetrametaphosphates; Graham's salt	

Section 03 - Hazard Identification

Inhalation	Inhalation of high airborne concentrations of dusts may result in coughing and sneezing.
Skin Contact / Absorption	No more than slightly irritating based on toxicity studies. The dry material may cause foreign body irritation in some individuals.
Eye Contact	Mild irritation

Ingestion....................……………… Not toxic if swallowed based on toxicity studies. No significant adverse health effects are expected if only small amounts (less than a mouthful) are swallowed. If ingested in large amounts, discomfort including nausea, vomiting, cramps and diarrhea are probable.

Exposure Limits……………………... OSHA and ACGIH have not established specific exposure limits for this material. However, OSHA and ACGIH have established limits for particulates not otherwise classified (PNOC) which are the least stringent exposure limits applicable to dusts. Components referred to herein may be regulated by specific Canadian provincial legislation. Please refer to exposure limits legislated for the province in which the substance will be used.

OSHA/PEL-TWA: 15mg/m^3 (total dust)
OSHA/PEL-TWA:5mg/m^3 (respirable)

ACGIH/TLV-TWA: 10mg/m^3 (inhalable)
ACGIH/TLV-TWA: 3mg/m^3 (respirable)

Section 04 - First Aid Measures

Inhalation....................……………….. Remove victim to fresh air. Give artificial respiration only if breathing has stopped. If breathing is difficult, give oxygen. Seek immediate medical attention.

Skin Contact / Absorption………….. Remove contaminated clothing. Wash affected area with soap and water. Seek medical attention if irritation occurs or persists.

Eye Contact..................……………..... Flush immediately with water for at least 20 minutes. Forcibly hold eyelids apart to ensure complete irrigation of eye tissue. Seek immediate medical attention

Ingestion....................……………… Give large amounts of water and induce vomiting. Do not give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention.

Additional Information.....………….. Not available

Section 05 - Fire Fighting

Conditions of Flammability………... Non-flammable

Means of Extinction........…………..... Product does not burn. Use appropriate extinguishing media for material that is supplying the fuel to the fire.

Flash Point....………………………….. Not applicable

Auto-ignition Temperature………….. Not applicable

Upper Flammable Limit …………….. Not applicable

Lower Flammable Limit...…………... Not applicable

Hazardous Combustible Products... Oxides of sodium and phosphorous

Special Fire Fighting Procedures..... Wear NIOSH-approved self-contained breathing apparatus and protective clothing.

Explosion Hazards…………………... Not available

Section 06 - Accidental Release Measures

Leak / Spill..................……………….... Wear appropriate personal protective equipment. Ventilate area. Stop or reduce leak if safe to do so. Sweep up material and place in appropriate container. Prevent material from entering sewers.

Deactivating Materials...…………... Not available

Section 07 - Handling and Storage

Handling Procedures.......………….... Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure.

Storage Requirements......……...….. Store in a cool, dry, well-ventilated place. Keep container tightly closed, and away from possible contamination by other materials.

Section 08 - Personal Protection and Exposure Controls

Protective Equipment

Eyes..……………………….………... Chemical goggles, full-face shield, or a full-face respirator is to be worn at all times when product is handled. Contact lenses should not be worn; they may contribute to severe eye injury.

Respiratory………………………….... Use NIOSH/MSHA approved respiratory protection equipment when airborne exposure limits are exceeded (see below). Consult the respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer.

Gloves……………………………….....	Impervious gloves of chemically resistant material should be worn. Wash contaminated clothing and dry thoroughly before reuse.
Clothing…………………….…….....	Body suits, aprons, and/or coveralls of chemical resistant material should be worn. Wash contaminated clothing and dry thoroughly before reuse.
Footwear…………………………….....	No special footwear is required other than what is mandated at place of work.

Engineering Controls

Ventilation Requirements…………......	Mechanical ventilation (dilution or local exhaust), process or personnel enclosure and control of process conditions should be provided. Supply sufficient replacement air to make up for air removed by exhaust systems.
Other………………………………….....	Emergency shower and eyewash should be in close proximity.

Section 09 - Physical and Chemical Properties

Physical State......……....………….....	Solid
Odor and Appearance…..………….....	Odorless granules or powder.
Odor Threshold....…………............	Not applicable
Specific Gravity (Water=1)…………..	Not available
Vapor Pressure (mm Hg, 20C)……...	Not available
Vapor Density (Air=1)..………………...	Not available
Evaporation Rate.........……..………..	Not available
Boiling Point...............……………......	Not available
Freeze/Melting Point.....…………….....	628°C
pH..........................…………………….	7.0 (1% solution)
Water/Oil Distribution Coefficient....	Not available
Bulk Density..............………………....	75 lbs/ft^3
% Volatiles by Volume……..……...	Not available
Solubility in Water...………………….....	Infinitely soluble, but dissolves slowly

Molecular Formula........................ $Na_2O_xP_2O_5$

Molecular Weight........................ Varies

Section 10 - Stability and Reactivity

Stability.. Stable under normal conditions.

Incompatibility.............................. Not available

Hazardous Products of Decomposition.. Oxides of sodium and phosphorous

Polymerization.............................. Will not occur

Section 11 - Toxicological Information

Irritancy.. Mild irritant

Sensitization................................. Not available

Chronic/Acute Effects.................. Prolonged contact with the dry powder may cause drying or chapping of the skin. May sequester calcium and cause calcium phosphate deposits in the kidneys. Chronic ingestion or inhalation may induce systemic phosphorous poisoning. Liver damage, kidney damage, jaw/tooth abnormalities, blood disorders and cardiovascular effects can result.

Synergistic Materials.................. Not available

Animal Toxicity Data.................. LD_{50} (Oral, Rat): 3053mg/kg
LD_{50} (Oral, Mouse): 4320mg/kg

Carcinogenicity............................ Not considered to be carcinogenic by IARC, NTP, ACGIH, and OSHA.

Reproductive Toxicity.................. Not available

Teratogenicity............................. Not available

Mutagenicity................................ Not available

Section 12 - Ecological Information

Fish Toxicity................................ Vendor has not conducted environmental toxicity studies with this product.

Biodegradability............……………... Vendor has not conducted biodegradation studies with this product since when dissolved/hydrolyzed in water it yields completely mineralized materials.

Environmental Effects………………. Not available

Section 13 - Disposal Consideration

Waste Disposal...........…...…………...Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 14 - Transportation Information

TDG Classification

Class……………..………………..…... Not regulated

Group...............…………….....……... Not regulated

PIN Number................……..………... Not regulated

Other…………………………………..... Secure containers (full and/or empty) with suitable hold down devises during shipment.

Section 15 - Regulatory Information

WHMIS Classification.......…………...Not a controlled product

NOTE: THE PRODUCT LISTED ON THIS MSDS HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN CONTROLLED PRODUCTS REGULATIONS. THIS MSDS CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS.

Section 16 - Other Information

Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations.

Attention: Receiver of the chemical goods / MSDS coordinator

As part of our commitment to the Canadian Association of Chemical Distributors (CACD) Responsible Distribution® initiative, ClearTech Industries Inc. and its associated companies require, as a condition of sale, that

Material Safety Data Sheet
acc. to OSHA and ANSI

1 Identification of substance:

Product details:

Product name: Potassium ethyl xanthate

Stock number:
A11450
L08073

Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

Information Department: Health, Safety and Environmental Department
Emergency information:
During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

Chemical characterization:
Description: (CAS#)
Potassium ethyl xanthate (CAS# 140-89-6): 100%
Identification number(s):
EINECS Number: 205-439-3

3 Hazards identification

Hazard description:

Xn Harmful

Information pertaining to particular dangers for man and environment
R 22 Harmful if swallowed.
R 36/37/38 Irritating to eyes, respiratory system and skin.
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

HEALTH	2
FIRE	1
REACTIVITY	1

Health (acute effects) = 2
Flammability = 1
Reactivity = 1

GHS label elements

Danger

3.1/3 - Toxic if swallowed.
3.2/2 - Causes skin irritation.
3.3/2A - Causes serious eye irritation.
3.8/3 - May cause respiratory irritation.
Prevention:
Avoid breathing dust/fume/gas/mist/vapours/spray.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
Response:
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
IF ON SKIN: Wash with plenty of soap and water.
IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Call a POISON CENTER or doctor/physician if you feel unwell.
Specific treatment (see label).
Rinse mouth.
If skin irritation occurs: Get medical advice/attention.
If eye irritation persists: Get medical advice/attention.

(Contd. on page 2)

(Contd. of page 1)

Take off contaminated clothing and wash before reuse.
Storage:
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Disposal:
Dispose of contents/container in accordance with local/regional/national/international regulations.

4 First aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing Seek immediate medical advice.

5 Fire fighting measures

Suitable extinguishing agents
Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Special hazards caused by the material, its products of combustion or resulting gases:
In case of fire, the following can be released:
Carbon monoxide and carbon dioxide
Sulfur oxides (SOx)
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Person-related safety precautions:
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Measures for environmental protection:
Do not allow material to be released to the environment without proper governmental permits.
Measures for cleaning/collecting:
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Additional information:
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling
Information for safe handling:
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Information about protection against explosions and fires: Keep ignition sources away.

Storage
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Store away from oxidizing agents.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

8 Exposure controls and personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace: Not required.

(Contd. on page 3)

Material Safety Data Sheet
acc. to OSHA and ANSI

(Contd. of page 2)

Additional information: No data

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Breathing equipment: Use suitable respirator when high concentrations are present.
Protection of hands:
Check protective gloves prior to each use for their proper condition.
Impervious gloves
Material of gloves
The selection of suitable gloves not only depends on the material, but also on quality.
Quality will vary from manufacturer to manufacturer.
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties:

General Information	
Form:	Powder
Color:	Light yellow
Odor:	Unpleasant
Change in condition	
Melting point/Melting range:	213°C (415°F) (decomposes)
Boiling point/Boiling range:	Not determined
Sublimation temperature / start:	Not determined
Flash point:	205°C (401°F)
Ignition temperature:	Not determined
Decomposition temperature:	Not determined
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined
Upper:	Not determined
Vapor pressure:	Not determined
Density:	Not determined
Solubility in / Miscibility with	
Water at 20°C (68°F):	1090 g/l
pH-value (100 g/l) at 20°°C (68°°F):	9-10

10 Stability and reactivity

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.
Materials to be avoided: Oxidizing agents
Dangerous reactions No dangerous reactions known
Dangerous products of decomposition:
Carbon monoxide and carbon dioxide
Sulfur oxides (SOx)

11 Toxicological information

Acute toxicity:

LD/LC50 values that are relevant for classification:		
Oral	LD50	308 mg/kg (mouse)
		1700 mg/kg (rat)

Primary irritant effect:
on the skin: Irritant to skin and mucous membranes.
on the eye: Irritating effect.
Sensitization: No sensitizing effects known.

(Contd. on page 4)

(Contd. of page 3)

Subacute to chronic toxicity:
Subacute to chronic toxicity:
The Registry of Toxic Effects of Chemical Substances (RTECS) reports the following effects in laboratory animals:
Behavioral - excitement.
Behavioral - muscle contraction or spasticity.
Behavioral - antipsychotic.
Behavioral - somnolence (general depressed activity).
Lungs, Thorax, or Respiration - respiratory depression
Blood - changes in erythrocyte (RBC) count.
Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - catalases.
Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - other enzymes.

Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

12 Ecological information:

General notes:
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

Product:
Recommendation Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

Not a hazardous material for transportation.

DOT regulations:
Hazard class: None

Land transport ADR/RID (cross-border)
ADR/RID class: None

Maritime transport IMDG:
IMDG Class: None

Air transport ICAO-TI and IATA-DGR:
ICAO/IATA Class: None

Transport/Additional information: Not dangerous according to the above specifications.

15 Regulations

Product related hazard informations:

Hazard symbols:
Xn Harmful

Risk phrases:
22 Harmful if swallowed.
36/37/38 Irritating to eyes, respiratory system and skin.

Safety phrases:
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
36/37 Wear suitable protective clothing and gloves.

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

(Contd. on page 5)

Material Safety Data Sheet

acc. to OSHA and ANSI

(Contd. of page 4)

Information about limitation of use: For use only by technically qualified individuals.

16 Other information:

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.

Contact: Zachariah Holt

Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

you forward the attached Material Safety Data Sheet(s) to all affected employees, customers, and end-users. ClearTech will send any available supplementary handling, health, and safety information to you at your request.

If you have any questions or concerns please call our customer service or technical service department.

ClearTech Industries Inc. - Locations

Corporate Head Office: 2302 Hanselman Avenue, Saskatoon, SK, S7L 5Z3
Phone: 306-664-2522
Fax: 306-665-6216

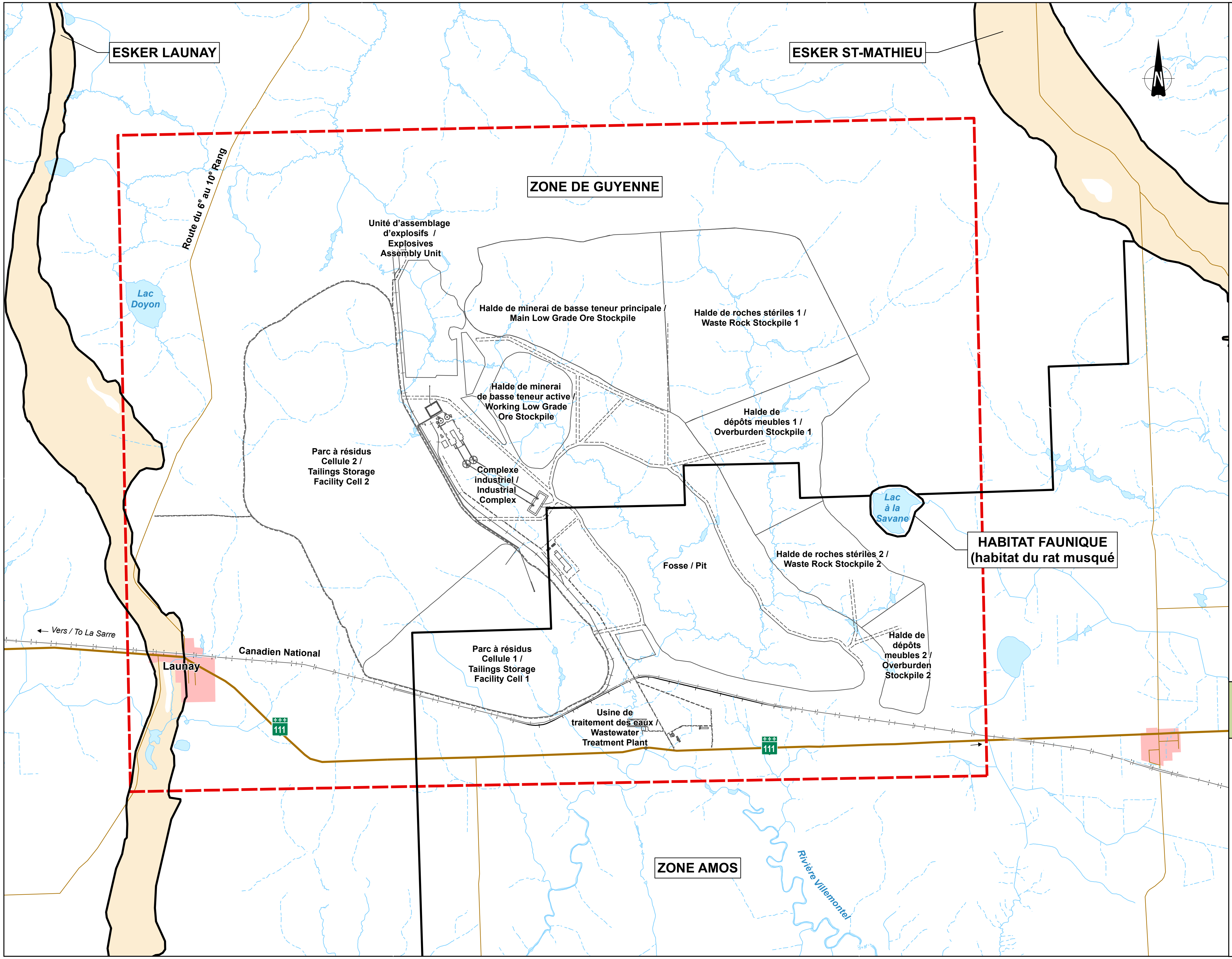
www.ClearTech.ca

Location	Address	Postal Code	Phone Number	Fax Number
Richmond, B.C.	12431 Horseshoe Way	V7A 4X6	604-272-4000	604-272-4596
Calgary, AB.	5516E - 40th St. S.E.	T2C 2A1	403-279-1096	403-236-0989
Edmonton, AB.	11750 - 180th Street	T5S 1N7	780-452-6000	780-452-4600
Saskatoon, SK.	2302 Hanselman Avenue	S7L 5Z3	306-933-0177	306-933-3282
Regina, SK.	555 Henderson Drive	S42 5X2	306-721-7737	306-721-8611
Winnipeg, MB.	340 Saulteaux Crescent	R3J 3T2	204-987-9777	204-987-9770
Mississauga, ON.	7480 Bath Road	L4T 1L2	905-612-0566	905-612-0575

24 Hour Emergency Number - All Locations - 306-664-2522

ANNEXE 2

Carte des zones d’affectation du territoire public



Limites / Boundaries

🟥 Zone d'étude locale / Local Study Area

▭ Plan d'affectation du territoire public (PAPT) / Territory Public Land Use Plan

Esker

Composantes du projet / Project Components

Infrastructure minière / Mining Infrastructure

Route / Road

Voie ferrée / Railway

Infrastructures / Infrastructure

111 Route principale / Main Road

Voie ferrée / Railway

Cours d'eau permanent / Permanent Stream

Cours d'eau intermittent / Intermittent Stream

Projet Dumont –
Étude d'impact sur l'environnement et le milieu social /
Dumont Project –
Environmental and Social Impact Assessment

Carte 1 / Map 1

Plan d'affectation du territoire public / Territory Public Land Use Plan

0 500 1 000 m

UTM, fuseau / Zone 17, NAD 83

Sources :

BDTQ, 1 : 20 000, MRNF Québec, 2006
Infrastructure: ESIA SUBMISSION SITE LAYOUT 2 WITH TEXT 12.08.16.dwg
ESKER : Commission géologique du Canada, 2005

Fichier / File : 111_15275_RQ_c1_PATP_130326.mxd

Mars / Marsh 2013

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