



## Section 2. Hazards identification

### 2.2 GHS label elements

**Hazard pictograms** : XL10-Gold 2-Mercaptoethanol



**Signal word**

: pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol  
ArcticExpress RIL competent cells

No signal word.  
Danger  
Warning

**Hazard statements**

: pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol

No known significant effects or critical hazards.  
H317 - May cause an allergic skin reaction.  
H318 - Causes serious eye damage.  
H361 - Suspected of damaging fertility or the unborn child.  
H373 - May cause damage to organs through prolonged or repeated exposure.  
H412 - Harmful to aquatic life with long lasting effects.  
ArcticExpress RIL competent cells H320 - Causes eye irritation.

### Precautionary statements

**Prevention**

: pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol

Not applicable.  
P201 - Obtain special instructions before use.  
P280 - Wear protective gloves, protective clothing and eye or face protection.  
P273 - Avoid release to the environment.  
P260 - Do not breathe vapor.

**Response**

ArcticExpress RIL competent cells

: pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol

Not applicable.  
P308 + P313 - IF exposed or concerned: Get medical advice or attention.  
P363 - Wash contaminated clothing before reuse.  
P302 + P352 - IF ON SKIN: Wash with plenty of water.  
P333 + P313 - If skin irritation or rash occurs: Get medical advice or attention.  
P305 + P351 + P338, P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.  
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P337 + P313 - If eye irritation persists: Get medical advice or attention.

**Storage**

: pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol  
ArcticExpress RIL competent cells

Not applicable.  
Not applicable.  
Not applicable.

**Disposal**

: pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol

Not applicable.  
P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Supplemental label elements**

ArcticExpress RIL competent cells

: pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol  
ArcticExpress RIL competent cells

Not applicable.  
None known.  
None known.  
None known.

## Section 2. Hazards identification

### 2.3 Other hazards

|                                         |                                   |             |
|-----------------------------------------|-----------------------------------|-------------|
| <b>Hazards not otherwise classified</b> | : pUC 18 DNA Control Plasmid      | None known. |
|                                         | XL10-Gold 2-Mercaptoethanol       | None known. |
|                                         | ArcticExpress RIL competent cells | None known. |

## Section 3. Composition/information on ingredients

|                          |                                   |         |
|--------------------------|-----------------------------------|---------|
| <b>Substance/mixture</b> | : pUC 18 DNA Control Plasmid      | Mixture |
|                          | XL10-Gold 2-Mercaptoethanol       | Mixture |
|                          | ArcticExpress RIL competent cells | Mixture |

| Ingredient name                          | %         | CAS number |
|------------------------------------------|-----------|------------|
| <b>XL10-Gold 2-Mercaptoethanol</b>       |           |            |
| 2-Mercaptoethanol                        | ≤5        | 60-24-2    |
| <b>ArcticExpress RIL competent cells</b> |           |            |
| Glycerol                                 | ≥10 - ≤25 | 56-81-5    |
| Dimethyl sulfoxide                       | ≤10       | 67-68-5    |
| Potassium chloride                       | ≤3        | 7447-40-7  |

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.**

Occupational exposure limits, if available, are listed in Section 8.

## Section 4. First aid measures

### 4.1 Description of necessary first aid measures

|                    |                                   |                                                                                                                                                                                                                                                                                                                  |
|--------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Eye contact</b> | : pUC 18 DNA Control Plasmid      | Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.                                                                                                                              |
|                    | XL10-Gold 2-Mercaptoethanol       | Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. |
|                    | ArcticExpress RIL competent cells | Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.                                                                                |
| <b>Inhalation</b>  | : pUC 18 DNA Control Plasmid      | Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.                                                                                                                                                                                    |
|                    | XL10-Gold 2-Mercaptoethanol       | Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If                |

## Section 4. First aid measures

not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

ArcticExpress RIL competent cells

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Skin contact

: pUC 18 DNA Control Plasmid

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

XL10-Gold 2-Mercaptoethanol

Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

ArcticExpress RIL competent cells

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

### Ingestion

: pUC 18 DNA Control Plasmid

Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

XL10-Gold 2-Mercaptoethanol

Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

## Section 4. First aid measures

ArcticExpress RIL competent cells Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### 4.2 Most important symptoms/effects, acute and delayed

#### Potential acute health effects

|                     |                                                                                                  |                                                                                                                                                             |
|---------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Eye contact</b>  | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol<br>ArcticExpress RIL competent cells | No known significant effects or critical hazards.<br>Causes serious eye damage.<br>Causes eye irritation.                                                   |
| <b>Inhalation</b>   | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol<br>ArcticExpress RIL competent cells | No known significant effects or critical hazards.<br>No known significant effects or critical hazards.<br>No known significant effects or critical hazards. |
| <b>Skin contact</b> | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol<br>ArcticExpress RIL competent cells | No known significant effects or critical hazards.<br>May cause an allergic skin reaction.<br>No known significant effects or critical hazards.              |
| <b>Ingestion</b>    | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol<br>ArcticExpress RIL competent cells | No known significant effects or critical hazards.<br>No known significant effects or critical hazards.<br>No known significant effects or critical hazards. |

#### Over-exposure signs/symptoms

|                     |                                                                                                      |                                                                                                                                                                                                                              |
|---------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Eye contact</b>  | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol<br><br>ArcticExpress RIL competent cells | No specific data.<br>Adverse symptoms may include the following:<br>pain<br>watering<br>redness<br>Adverse symptoms may include the following:<br>irritation<br>watering<br>redness                                          |
| <b>Inhalation</b>   | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol<br><br>ArcticExpress RIL competent cells | No specific data.<br>Adverse symptoms may include the following:<br>reduced fetal weight<br>increase in fetal deaths<br>skeletal malformations<br>No specific data.                                                          |
| <b>Skin contact</b> | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol<br><br>ArcticExpress RIL competent cells | No specific data.<br>Adverse symptoms may include the following:<br>pain or irritation<br>redness<br>blistering may occur<br>reduced fetal weight<br>increase in fetal deaths<br>skeletal malformations<br>No specific data. |

## Section 4. First aid measures

|                  |                                   |                                                                                                                                            |
|------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ingestion</b> | : pUC 18 DNA Control Plasmid      | No specific data.                                                                                                                          |
|                  | XL10-Gold 2-Mercaptoethanol       | Adverse symptoms may include the following:<br>stomach pains<br>reduced fetal weight<br>increase in fetal deaths<br>skeletal malformations |
|                  | ArcticExpress RIL competent cells | No specific data.                                                                                                                          |

### 4.3 Indication of immediate medical attention and special treatment needed, if necessary

|                                   |                                   |                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Notes to physician</b>         | : pUC 18 DNA Control Plasmid      | Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.                                                                                                                                                                                                                                                                         |
|                                   | XL10-Gold 2-Mercaptoethanol       | Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.                                                                                                                                                                                                                                                                         |
|                                   | ArcticExpress RIL competent cells | Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.                                                                                                                                                                                                                                                                         |
| <b>Specific treatments</b>        | : pUC 18 DNA Control Plasmid      | No specific treatment.                                                                                                                                                                                                                                                                                                                                                                            |
|                                   | XL10-Gold 2-Mercaptoethanol       | No specific treatment.                                                                                                                                                                                                                                                                                                                                                                            |
|                                   | ArcticExpress RIL competent cells | No specific treatment.                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Protection of first-aiders</b> | : pUC 18 DNA Control Plasmid      | No action shall be taken involving any personal risk or without suitable training.                                                                                                                                                                                                                                                                                                                |
|                                   | XL10-Gold 2-Mercaptoethanol       | No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. |
|                                   | ArcticExpress RIL competent cells | No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.                                                                                                                                                                                                                          |

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### 5.1 Extinguishing media

|                                       |                                   |                                                               |
|---------------------------------------|-----------------------------------|---------------------------------------------------------------|
| <b>Suitable extinguishing media</b>   | : pUC 18 DNA Control Plasmid      | Use an extinguishing agent suitable for the surrounding fire. |
|                                       | XL10-Gold 2-Mercaptoethanol       | Use an extinguishing agent suitable for the surrounding fire. |
|                                       | ArcticExpress RIL competent cells | Use an extinguishing agent suitable for the surrounding fire. |
| <b>Unsuitable extinguishing media</b> | : pUC 18 DNA Control Plasmid      | None known.                                                   |
|                                       | XL10-Gold 2-Mercaptoethanol       | None known.                                                   |
|                                       | ArcticExpress RIL competent cells | None known.                                                   |

### 5.2 Special hazards arising from the substance or mixture

## Section 5. Fire-fighting measures

|                                                   |                                   |                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Specific hazards arising from the chemical</b> | : pUC 18 DNA Control Plasmid      | In a fire or if heated, a pressure increase will occur and the container may burst.                                                                                                                                                                                                       |
|                                                   | XL10-Gold 2-Mercaptoethanol       | In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. |
|                                                   | ArcticExpress RIL competent cells | In a fire or if heated, a pressure increase will occur and the container may burst.                                                                                                                                                                                                       |
| <b>Hazardous thermal decomposition products</b>   | : pUC 18 DNA Control Plasmid      | No specific data.                                                                                                                                                                                                                                                                         |
|                                                   | XL10-Gold 2-Mercaptoethanol       | Decomposition products may include the following materials:<br>carbon dioxide<br>carbon monoxide<br>sulfur oxides<br>halogenated compounds<br>metal oxide/oxides                                                                                                                          |
|                                                   | ArcticExpress RIL competent cells | Decomposition products may include the following materials:<br>carbon dioxide<br>carbon monoxide<br>sulfur oxides<br>halogenated compounds<br>metal oxide/oxides                                                                                                                          |

### 5.3 Advice for firefighters

|                                                       |                                   |                                                                                                                                                                                             |
|-------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Special protective actions for fire-fighters</b>   | : pUC 18 DNA Control Plasmid      | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. |
|                                                       | XL10-Gold 2-Mercaptoethanol       | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. |
|                                                       | ArcticExpress RIL competent cells | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. |
| <b>Special protective equipment for fire-fighters</b> | : pUC 18 DNA Control Plasmid      | Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.                         |
|                                                       | XL10-Gold 2-Mercaptoethanol       | Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.                         |
|                                                       | ArcticExpress RIL competent cells | Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.                         |



## Section 6. Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

|                                    |                                   |                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>For non-emergency personnel</b> | : pUC 18 DNA Control Plasmid      | No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.                                                                                                                          |
|                                    | XL10-Gold 2-Mercaptoethanol       | No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.  |
|                                    | ArcticExpress RIL competent cells | No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment. |
| <b>For emergency responders</b>    | : pUC 18 DNA Control Plasmid      | If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".                                                                                                                                                                                          |
|                                    | XL10-Gold 2-Mercaptoethanol       | If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".                                                                                                                                                                                          |
|                                    | ArcticExpress RIL competent cells | If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".                                                                                                                                                                                          |

|                                      |                                   |                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>6.2 Environmental precautions</b> | : pUC 18 DNA Control Plasmid      | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).                                                                                              |
|                                      | XL10-Gold 2-Mercaptoethanol       | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. |
|                                      | ArcticExpress RIL competent cells | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).                                                                                              |

### 6.3 Methods and materials for containment and cleaning up



## Section 6. Accidental release measures

|                                |                                   |                                                                                                                                                                                                                                                                                               |
|--------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Methods for cleaning up</b> | : pUC 18 DNA Control Plasmid      | Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor. |
|                                | XL10-Gold 2-Mercaptoethanol       | Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor. |
|                                | ArcticExpress RIL competent cells | Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor. |

## Section 7. Handling and storage

### 7.1 Precautions for safe handling

|                                               |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Protective measures</b>                    | : pUC 18 DNA Control Plasmid      | Put on appropriate personal protective equipment (see Section 8).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                               | XL10-Gold 2-Mercaptoethanol       | Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container. |
|                                               | ArcticExpress RIL competent cells | Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Advice on general occupational hygiene</b> | : pUC 18 DNA Control Plasmid      | Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                               | XL10-Gold 2-Mercaptoethanol       | Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## Section 7. Handling and storage

|                                                                         |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                         | ArcticExpress RIL competent cells | contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures. Potentially biohazardous material. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.                                              |
| <b>7.2 Conditions for safe storage, including any incompatibilities</b> | : pUC 18 DNA Control Plasmid      | Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.                  |
|                                                                         | XL10-Gold 2-Mercaptoethanol       | Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. |
|                                                                         | ArcticExpress RIL competent cells | Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.                  |

### 7.3 Specific end use(s)

|                                             |                                                                                                  |                                                                                                                                                                   |
|---------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Recommendations</b>                      | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol<br>ArcticExpress RIL competent cells | Industrial applications, Professional applications.<br>Industrial applications, Professional applications.<br>Industrial applications, Professional applications. |
| <b>Industrial sector specific solutions</b> | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol<br>ArcticExpress RIL competent cells | Not available.<br>Not available.<br>Not available.                                                                                                                |

## Section 8. Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational exposure limits

| Ingredient name                                                                                                                                                         | Exposure limits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>XL10-Gold 2-Mercaptoethanol</b><br>2-Mercaptoethanol<br><br><b>ArcticExpress RIL competent cells</b><br>Glycerol<br><br>Dimethyl sulfoxide<br><br>Potassium chloride | <b>OARS WEEL (United States, 1/2021).</b><br><b>Absorbed through skin.</b><br>TWA: 0.2 ppm 8 hours.<br><br><b>OSHA PEL 1989 (United States, 3/1989).</b><br>TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction<br>TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Total dust<br><b>OSHA PEL (United States, 5/2018).</b><br>TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction<br>TWA: 15 mg/m <sup>3</sup> 8 hours. Form: Total dust<br><b>OARS WEEL (United States, 1/2021).</b><br>TWA: 250 ppm 8 hours.<br>None. |

#### Biological exposure indices

No exposure indices known.

### 8.2 Exposure controls

#### Appropriate engineering controls

- : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

#### Environmental exposure controls

- : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

#### Individual protection measures

##### Hygiene measures

- : Handle as biohazard material (Biosafety level 1). Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

##### Eye/face protection

- : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

##### Skin protection

##### Hand protection

- : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

##### Body protection

- : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

## Section 8. Exposure controls/personal protection

- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

## Section 9. Physical and chemical properties and safety characteristics

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

### Appearance

- Physical state** : pUC 18 DNA Control Plasmid Liquid.  
XL10-Gold 2-Mercaptoethanol Liquid.  
ArcticExpress RIL competent cells Liquid.
- Color** : pUC 18 DNA Control Plasmid Not available.  
XL10-Gold 2-Mercaptoethanol Not available.  
ArcticExpress RIL competent cells Not available.
- Odor** : pUC 18 DNA Control Plasmid Not available.  
XL10-Gold 2-Mercaptoethanol Not available.  
ArcticExpress RIL competent cells Not available.
- Odor threshold** : pUC 18 DNA Control Plasmid Not available.  
XL10-Gold 2-Mercaptoethanol Not available.  
ArcticExpress RIL competent cells Not available.
- pH** : pUC 18 DNA Control Plasmid 7.5  
XL10-Gold 2-Mercaptoethanol Not available.  
ArcticExpress RIL competent cells 6.4
- Melting point/freezing point** : pUC 18 DNA Control Plasmid 0°C (32°F)  
XL10-Gold 2-Mercaptoethanol Not available.  
ArcticExpress RIL competent cells Not available.
- Boiling point, initial boiling point, and boiling range** : pUC 18 DNA Control Plasmid 100°C (212°F)  
XL10-Gold 2-Mercaptoethanol Not available.  
ArcticExpress RIL competent cells Not available.

| Flash point | Ingredient name                          | Closed cup |       |           | Open cup |       |        |
|-------------|------------------------------------------|------------|-------|-----------|----------|-------|--------|
|             |                                          | °C         | °F    | Method    | °C       | °F    | Method |
|             | <b>XL10-Gold 2-Mercaptoethanol</b>       |            |       |           |          |       |        |
|             | 2-Mercaptoethanol                        | 74         | 165.2 |           | 74       | 165.2 |        |
|             | <b>ArcticExpress RIL competent cells</b> |            |       |           |          |       |        |
|             | Dimethyl sulfoxide                       | 87         | 188.6 | ASTM D 93 | 87       | 188.6 |        |
|             | Glycerol                                 |            |       |           | 177      | 350.6 |        |

- Evaporation rate** : pUC 18 DNA Control Plasmid Not available.  
XL10-Gold 2-Mercaptoethanol Not available.  
ArcticExpress RIL competent cells Not available.
- Flammability** : pUC 18 DNA Control Plasmid Not applicable.  
XL10-Gold 2-Mercaptoethanol Not applicable.  
ArcticExpress RIL competent cells Not applicable.

## Section 9. Physical and chemical properties and safety characteristics

**Lower and upper explosion limit/flammability limit** : pUC 18 DNA Control Plasmid Not available.  
 XL10-Gold 2-Mercaptoethanol Not available.  
 ArcticExpress RIL competent cells Not available.

| Ingredient name                          | Vapor Pressure at 20°C |       |        | Vapor pressure at 50°C |      |        |
|------------------------------------------|------------------------|-------|--------|------------------------|------|--------|
|                                          | mm Hg                  | kPa   | Method | mm Hg                  | kPa  | Method |
| <b>pUC 18 DNA Control Plasmid</b>        |                        |       |        |                        |      |        |
| water                                    | 23.8                   | 3.2   |        | 92.258                 | 12.3 |        |
| <b>XL10-Gold 2-Mercaptoethanol</b>       |                        |       |        |                        |      |        |
| water                                    | 23.8                   | 3.2   |        | 92.258                 | 12.3 |        |
| 2-Mercaptoethanol                        | 0.98                   | 0.13  |        |                        |      |        |
| <b>ArcticExpress RIL competent cells</b> |                        |       |        |                        |      |        |
| water                                    | 23.8                   | 3.2   |        | 92.258                 | 12.3 |        |
| Dimethyl sulfoxide                       | 0.42                   | 0.056 | EU A.4 |                        |      |        |

**Relative vapor density** : pUC 18 DNA Control Plasmid Not available.  
 XL10-Gold 2-Mercaptoethanol Not available.  
 ArcticExpress RIL competent cells Not available.

**Relative density** : pUC 18 DNA Control Plasmid Not available.  
 XL10-Gold 2-Mercaptoethanol Not available.  
 ArcticExpress RIL competent cells Not available.

| Media                                    | Result  |
|------------------------------------------|---------|
| <b>pUC 18 DNA Control Plasmid</b>        |         |
| water                                    | Soluble |
| <b>XL10-Gold 2-Mercaptoethanol</b>       |         |
| water                                    | Soluble |
| <b>ArcticExpress RIL competent cells</b> |         |
| water                                    | Soluble |

**Partition coefficient: n-octanol/water** : pUC 18 DNA Control Plasmid Not applicable.  
 XL10-Gold 2-Mercaptoethanol Not applicable.  
 ArcticExpress RIL competent cells Not applicable.

| Ingredient name                          | °C         | °F           | Method |
|------------------------------------------|------------|--------------|--------|
| <b>XL10-Gold 2-Mercaptoethanol</b>       |            |              |        |
| 2-Mercaptoethanol                        | 295        | 563          |        |
| <b>ArcticExpress RIL competent cells</b> |            |              |        |
| Dimethyl sulfoxide                       | 300 to 302 | 572 to 575.6 |        |
| Glycerol                                 | 370        | 698          |        |

## Section 9. Physical and chemical properties and safety characteristics

**Decomposition temperature** : pUC 18 DNA Control Plasmid Not available.  
 XL10-Gold 2-Mercaptoethanol Not available.  
 ArcticExpress RIL competent cells Not available.

**Viscosity** : pUC 18 DNA Control Plasmid Not available.  
 XL10-Gold 2-Mercaptoethanol Not available.  
 ArcticExpress RIL competent cells Not available.

### Particle characteristics

**Median particle size** : pUC 18 DNA Control Plasmid Not applicable.  
 XL10-Gold 2-Mercaptoethanol Not applicable.  
 ArcticExpress RIL competent cells Not applicable.

## Section 10. Stability and reactivity

**10.1 Reactivity** : pUC 18 DNA Control Plasmid No specific test data related to reactivity available for this product or its ingredients.  
 XL10-Gold 2-Mercaptoethanol No specific test data related to reactivity available for this product or its ingredients.  
 ArcticExpress RIL competent cells No specific test data related to reactivity available for this product or its ingredients.

**10.2 Chemical stability** : pUC 18 DNA Control Plasmid The product is stable.  
 XL10-Gold 2-Mercaptoethanol The product is stable.  
 ArcticExpress RIL competent cells The product is stable.

**10.3 Possibility of hazardous reactions** : pUC 18 DNA Control Plasmid Under normal conditions of storage and use, hazardous reactions will not occur.  
 XL10-Gold 2-Mercaptoethanol Under normal conditions of storage and use, hazardous reactions will not occur.  
 ArcticExpress RIL competent cells Under normal conditions of storage and use, hazardous reactions will not occur.

**10.4 Conditions to avoid** : pUC 18 DNA Control Plasmid No specific data.  
 XL10-Gold 2-Mercaptoethanol No specific data.  
 ArcticExpress RIL competent cells No specific data.

**10.5 Incompatible materials** : pUC 18 DNA Control Plasmid May react or be incompatible with oxidizing materials.  
 XL10-Gold 2-Mercaptoethanol May react or be incompatible with oxidizing materials.  
 ArcticExpress RIL competent cells May react or be incompatible with oxidizing materials.

**10.6 Hazardous decomposition products** : pUC 18 DNA Control Plasmid Under normal conditions of storage and use, hazardous decomposition products should not be produced.  
 XL10-Gold 2-Mercaptoethanol Under normal conditions of storage and use, hazardous decomposition products should not be produced.  
 ArcticExpress RIL competent cells Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

| Product/ingredient name                                           | Result      | Species | Dose        | Exposure |
|-------------------------------------------------------------------|-------------|---------|-------------|----------|
| <b>XL10-Gold</b><br><b>2-Mercaptoethanol</b><br>2-Mercaptoethanol | LD50 Oral   | Rat     | 244 mg/kg   | -        |
| <b>ArcticExpress RIL</b><br><b>competent cells</b><br>Glycerol    | LD50 Oral   | Rat     | 12600 mg/kg | -        |
| Dimethyl sulfoxide                                                | LD50 Dermal | Rat     | 40000 mg/kg | -        |
|                                                                   | LD50 Oral   | Rat     | 14500 mg/kg | -        |
| Potassium chloride                                                | LD50 Oral   | Rat     | 2600 mg/kg  | -        |

#### Irritation/Corrosion

| Product/ingredient name                                           | Result                 | Species | Score | Exposure        | Observation |
|-------------------------------------------------------------------|------------------------|---------|-------|-----------------|-------------|
| <b>XL10-Gold</b><br><b>2-Mercaptoethanol</b><br>2-Mercaptoethanol | Eyes - Severe irritant | Rabbit  | -     | 2 mg            | -           |
| <b>ArcticExpress RIL</b><br><b>competent cells</b><br>Glycerol    | Eyes - Mild irritant   | Rabbit  | -     | 24 hours 500 mg | -           |
|                                                                   | Skin - Mild irritant   | Rabbit  | -     | 24 hours 500 mg | -           |
| Dimethyl sulfoxide                                                | Eyes - Mild irritant   | Rabbit  | -     | 100 mg          | -           |
|                                                                   | Eyes - Mild irritant   | Rabbit  | -     | 24 hours 500 mg | -           |
|                                                                   | Skin - Mild irritant   | Rabbit  | -     | 100 mg          | -           |
|                                                                   | Skin - Mild irritant   | Rabbit  | -     | 24 hours 500 mg | -           |
| Potassium chloride                                                | Eyes - Mild irritant   | Rabbit  | -     | 24 hours 500 mg | -           |

#### Sensitization

Not available.

#### Mutagenicity

Conclusion/Summary : Not available.

#### Carcinogenicity

Conclusion/Summary : Not available.

#### Reproductive toxicity

Conclusion/Summary : Not available.

#### Teratogenicity

Conclusion/Summary : Not available.

#### Specific target organ toxicity (single exposure)

| Name                                                    | Category   | Route of exposure | Target organs                |
|---------------------------------------------------------|------------|-------------------|------------------------------|
| <b>XL10-Gold 2-Mercaptoethanol</b><br>2-Mercaptoethanol | Category 3 | -                 | Respiratory tract irritation |

#### Specific target organ toxicity (repeated exposure)



## Section 11. Toxicological information

| Name                                                    | Category   | Route of exposure | Target organs |
|---------------------------------------------------------|------------|-------------------|---------------|
| <b>XL10-Gold 2-Mercaptoethanol</b><br>2-Mercaptoethanol | Category 2 | oral              | heart, liver  |

### Aspiration hazard

Not available.

### Information on the likely routes of exposure

- : pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol  
ArcticExpress RIL competent cells
- Not available.  
Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.  
Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

### Potential acute health effects

- Eye contact** : pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol  
ArcticExpress RIL competent cells  
No known significant effects or critical hazards.  
Causes serious eye damage.  
Causes eye irritation.
- Inhalation** : pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol  
ArcticExpress RIL competent cells  
No known significant effects or critical hazards.  
No known significant effects or critical hazards.  
No known significant effects or critical hazards.
- Skin contact** : pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol  
ArcticExpress RIL competent cells  
No known significant effects or critical hazards.  
May cause an allergic skin reaction.  
No known significant effects or critical hazards.
- Ingestion** : pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol  
ArcticExpress RIL competent cells  
No known significant effects or critical hazards.  
No known significant effects or critical hazards.  
No known significant effects or critical hazards.

### Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol  
ArcticExpress RIL competent cells  
No specific data.  
Adverse symptoms may include the following:  
pain  
watering  
redness  
Adverse symptoms may include the following:  
irritation  
watering  
redness
- Inhalation** : pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol  
ArcticExpress RIL competent cells  
No specific data.  
Adverse symptoms may include the following:  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations  
No specific data.
- Skin contact** : pUC 18 DNA Control Plasmid  
XL10-Gold 2-Mercaptoethanol  
ArcticExpress RIL competent cells  
No specific data.  
Adverse symptoms may include the following:  
pain or irritation  
redness  
blistering may occur  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations  
No specific data.

## Section 11. Toxicological information

|                  |                                                             |                                                                                                                                                                 |
|------------------|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ingestion</b> | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol | No specific data.<br>Adverse symptoms may include the following:<br>stomach pains<br>reduced fetal weight<br>increase in fetal deaths<br>skeletal malformations |
|                  | ArcticExpress RIL competent cells                           | No specific data.                                                                                                                                               |

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Long term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Potential chronic health effects

|                              |                                                                                                  |                                                                                                                                                                                                                             |
|------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General</b>               | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol                                      | No known significant effects or critical hazards.<br>May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels. |
|                              | ArcticExpress RIL competent cells                                                                | No known significant effects or critical hazards.                                                                                                                                                                           |
| <b>Carcinogenicity</b>       | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol<br>ArcticExpress RIL competent cells | No known significant effects or critical hazards.<br>No known significant effects or critical hazards.<br>No known significant effects or critical hazards.                                                                 |
| <b>Mutagenicity</b>          | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol<br>ArcticExpress RIL competent cells | No known significant effects or critical hazards.<br>No known significant effects or critical hazards.<br>No known significant effects or critical hazards.                                                                 |
| <b>Reproductive toxicity</b> | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol<br>ArcticExpress RIL competent cells | No known significant effects or critical hazards.<br>Suspected of damaging fertility or the unborn child.<br>No known significant effects or critical hazards.                                                              |

### Numerical measures of toxicity

#### Acute toxicity estimates

| Product/ingredient name                  | Oral (mg/kg) | Dermal (mg/kg) | Inhalation (gases) (ppm) | Inhalation (vapors) (mg/l) | Inhalation (dusts and mists) (mg/l) |
|------------------------------------------|--------------|----------------|--------------------------|----------------------------|-------------------------------------|
| <b>XL10-Gold 2-Mercaptoethanol</b>       |              |                |                          |                            |                                     |
| XL10-Gold 2-Mercaptoethanol              | 4615.5       | 4545.5         | N/A                      | 60.7                       | N/A                                 |
| 2-Mercaptoethanol                        | 244          | 200            | N/A                      | 3                          | N/A                                 |
| <b>ArcticExpress RIL competent cells</b> |              |                |                          |                            |                                     |
| ArcticExpress RIL competent cells        | 136842.1     | N/A            | N/A                      | N/A                        | N/A                                 |
| Glycerol                                 | 12600        | N/A            | N/A                      | N/A                        | N/A                                 |
| Dimethyl sulfoxide                       | 14500        | 40000          | N/A                      | N/A                        | N/A                                 |
| Potassium chloride                       | 2600         | N/A            | N/A                      | N/A                        | N/A                                 |

## Section 12. Ecological information

### 12.1 Toxicity

| Product/ingredient name                                                                                                      | Result                               | Species                                                             | Exposure |
|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------------------------------------------|----------|
| <b>ArcticExpress RIL competent cells</b><br>Glycerol<br>Dimethyl sulfoxide<br><br><br><br><br><br><br><br>Potassium chloride | Acute LC50 54000 mg/l Fresh water    | Fish - Oncorhynchus mykiss                                          | 96 hours |
|                                                                                                                              | Acute LC50 25000 ppm Fresh water     | Daphnia - Daphnia magna - Neonate                                   | 48 hours |
|                                                                                                                              | Acute LC50 34000000 µg/l Fresh water | Fish - Pimephales promelas                                          | 96 hours |
|                                                                                                                              | Chronic NOEC 100 µl/L Marine water   | Algae - Ulva lactuca                                                | 72 hours |
|                                                                                                                              | Chronic NOEC 100 µl/L Fresh water    | Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling) | 21 days  |
|                                                                                                                              | Acute EC50 9.24 g/L Fresh water      | Algae - Desmodesmus subspicatus                                     | 72 hours |
|                                                                                                                              | Acute EC50 1337000 µg/l Fresh water  | Algae - Navicula seminulum                                          | 96 hours |
|                                                                                                                              | Acute EC50 83000 µg/l Fresh water    | Daphnia - Daphnia magna                                             | 48 hours |
|                                                                                                                              | Acute LC50 9.68 mg/l Fresh water     | Crustaceans - Pseudosida ramosa - Neonate                           | 48 hours |
|                                                                                                                              | Acute LC50 509.65 mg/l Fresh water   | Fish - Danio rerio                                                  | 96 hours |

### 12.2 Persistence and degradability

| Product/ingredient name                                 | Test                                                                                 | Result                       | Dose    | Inoculum |
|---------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------|---------|----------|
| <b>XL10-Gold 2-Mercaptoethanol</b><br>2-Mercaptoethanol | OECD 310 Ready Biodegradability - CO <sub>2</sub> in Sealed Vessels (Headspace Test) | 69 % - Not readily - 60 days | 20 mg/l | -        |
| <b>ArcticExpress RIL competent cells</b><br>Glycerol    | 301D Ready Biodegradability - Closed Bottle Test                                     | 93 % - 30 days               | -       | -        |
| Dimethyl sulfoxide                                      | OECD 301D Ready Biodegradability - Closed Bottle Test                                | 31 % - Not readily - 28 days | -       | -        |

| Product/ingredient name                                        | Aquatic half-life | Photolysis | Biodegradability |
|----------------------------------------------------------------|-------------------|------------|------------------|
| <b>XL10-Gold 2-Mercaptoethanol</b><br>2-Mercaptoethanol        | -                 | -          | Not readily      |
| <b>ArcticExpress RIL competent cells</b><br>Dimethyl sulfoxide | -                 | -          | Not readily      |
| Potassium chloride                                             | -                 | -          | Readily          |

### 12.3 Bioaccumulative potential

## Section 12. Ecological information

| Product/ingredient name                  | LogP <sub>ow</sub> | BCF  | Potential |
|------------------------------------------|--------------------|------|-----------|
| <b>XL10-Gold</b>                         |                    |      |           |
| <b>2-Mercaptoethanol</b>                 |                    |      |           |
| 2-Mercaptoethanol                        | -0.056             | -    | low       |
| <b>ArcticExpress RIL competent cells</b> |                    |      |           |
| Glycerol                                 | -1.76              | -    | low       |
| Dimethyl sulfoxide                       | -1.35              | 3.16 | low       |
| Potassium chloride                       | -0.46              | -    | low       |

### 12.4 Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : Not available.

**12.5 Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

### 13.1 Waste treatment methods

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## Section 14. Transport information

**DOT / TDG / Mexico / IMDG / IATA** : Not regulated.

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to IMO instruments** : Not available.

## Section 15. Regulatory information

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

**U.S. Federal regulations** : TSCA 8(a) CDR Exempt/Partial exemption: Not determined  
Clean Water Act (CWA) 311: Edetic acid

**Clean Air Act Section 112** : Listed

(b) Hazardous Air Pollutants (HAPs)

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

### SARA 302/304

#### Composition/information on ingredients

No products were found.

**SARA 304 RQ** : Not applicable.

### SARA 311/312

|                       |                                                             |                                                                                                                                                             |
|-----------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Classification</b> | : pUC 18 DNA Control Plasmid<br>XL10-Gold 2-Mercaptoethanol | Not applicable.<br>SERIOUS EYE DAMAGE - Category 1<br>SKIN SENSITIZATION - Category 1<br>TOXIC TO REPRODUCTION - Category 2<br>EYE IRRITATION - Category 2B |
|                       | ArcticExpress RIL competent cells                           |                                                                                                                                                             |

#### Composition/information on ingredients

| Name                                                    | %         | Classification                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>XL10-Gold 2-Mercaptoethanol</b><br>2-Mercaptoethanol | ≤5        | FLAMMABLE LIQUIDS - Category 4<br>ACUTE TOXICITY (oral) - Category 3<br>ACUTE TOXICITY (dermal) - Category 2<br>ACUTE TOXICITY (inhalation) - Category 3<br>SKIN IRRITATION - Category 2<br>SERIOUS EYE DAMAGE - Category 1<br>SKIN SENSITIZATION - Category 1A<br>TOXIC TO REPRODUCTION - Category 2<br>SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3<br>SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 |
| <b>ArcticExpress RIL competent cells</b>                |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Glycerol                                                | ≥10 - ≤25 | EYE IRRITATION - Category 2B                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Dimethyl sulfoxide                                      | ≤10       | FLAMMABLE LIQUIDS - Category 4<br>EYE IRRITATION - Category 2B                                                                                                                                                                                                                                                                                                                                                                                                           |
| Sucrose                                                 | ≤10       | COMBUSTIBLE DUSTS                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Potassium chloride                                      | ≤3        | EYE IRRITATION - Category 2B                                                                                                                                                                                                                                                                                                                                                                                                                                             |

### State regulations

**Massachusetts** : The following components are listed: GLYCERINE MIST; SUCROSE DUST; 2-MERCAPTOETHANOL

**New York** : None of the components are listed.

**New Jersey** : The following components are listed: GLYCERIN; DIMETHYL SULFOXIDE; THIOGLYCOL

## Section 15. Regulatory information

**Pennsylvania** : The following components are listed: 1,2,3-PROPANETRIOL; .ALPHA.-D-GLUCOPYRANOSIDE, .BETA.-D-FRUCTOFURANOSYL; ETHANOL, 2-MERCAPTO-

### California Prop. 65

This product does not require a Safe Harbor warning under California Prop. 65.

### International regulations

#### Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

#### Montreal Protocol

Not listed.

#### Stockholm Convention on Persistent Organic Pollutants

Not listed.

#### Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

#### UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

### Inventory list

**Australia** : All components are listed or exempted.  
**Canada** : All components are listed or exempted.  
**China** : Not determined.  
**Eurasian Economic Union** : **Russian Federation inventory**: All components are listed or exempted.  
**Japan** : **Japan inventory (CSCL)**: Not determined.  
**Japan inventory (ISHL)**: All components are listed or exempted.  
**New Zealand** : Not determined.  
**Philippines** : Not determined.  
**Republic of Korea** : All components are listed or exempted.  
**Taiwan** : All components are listed or exempted.  
**Thailand** : Not determined.  
**Turkey** : Not determined.  
**United States** : All components are active or exempted.  
**Viet Nam** : All components are listed or exempted.

## Section 16. Other information

### Procedure used to derive the classification

| Classification                                                                                                                                                                                                                                                                                                                               | Justification                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>XL10-Gold 2-Mercaptoethanol</b><br>SERIOUS EYE DAMAGE - Category 1<br>SKIN SENSITIZATION - Category 1<br>TOXIC TO REPRODUCTION - Category 2<br>SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2<br>AQUATIC HAZARD (LONG-TERM) - Category 3<br><br><b>ArcticExpress RIL competent cells</b><br>EYE IRRITATION - Category 2B | Calculation method<br>Calculation method<br>Calculation method<br>Calculation method<br>Calculation method<br><br>Calculation method |

### History

**Date of issue** : 03/03/2023  
**Date of previous issue** : 12/03/2020

## Section 16. Other information

**Version** : 7

**Key to abbreviations** :

- ATE = Acute Toxicity Estimate
- BCF = Bioconcentration Factor
- GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- IATA = International Air Transport Association
- IBC = Intermediate Bulk Container
- IMDG = International Maritime Dangerous Goods
- LogPow = logarithm of the octanol/water partition coefficient
- MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
- N/A = Not available
- UN = United Nations

📌 Indicates information that has changed from previously issued version.

### Notice to reader

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