

SAFETY DATA SHEET



QuikChange Lightning Site-Directed Mutagenesis Kit, Part Number 210518

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

1.1 Product identifier

Product name	: QuikChange Lightning Site-Directed Mutagenesis Kit, Part Number 210518
Part No. (Kit)	: 210518
Part No.	: QuikSolution 200516-51
	QuikChange Lightning 210518-51
	Enzyme
	10× QuikChange 210518-53
	Lightning Buffer
	QuikChange XL dNTP 200517-51
	Mix
	Dpn I Enzyme 210518-52
	pWS4.5 Control 200518-55
	Template
	Control Primer 1 200518-53
	(34-mer)
	Control Primer 2 200518-54
	(34-mer)
	XL10-Gold 200315-41
	Ultracompetent cells
	XL10-Gold 200314-43
	2-Mercaptoethanol
	pUC 18 DNA Control 200231-42
	Plasmid

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

Identified uses	
Analytical reagent.	
QuikSolution	500 µl
QuikChange Lightning Enzyme	10 µl (10 reactions)
10× QuikChange Lightning Buffer	500 µl
QuikChange XL dNTP Mix	10 µl
Dpn I Enzyme	20 µl (10 reactions)
pWS4.5 Control Template	50 ng (5 ng/µl)
Control Primer 1 (34-mer)	750 ng (100 ng/µl)
Control Primer 2 (34-mer)	750 ng (100 ng/µl)
XL10-Gold Ultracompetent cells	500 µl
XL10-Gold 2-Mercaptoethanol	50 µl
pUC 18 DNA Control Plasmid	10 µl (0.1 ng/µl)

1.3 Details of the supplier of the safety data sheet

Agilent Technologies Manufacturing GmbH & Co. KG
Hewlett-Packard-Str. 8
76337 Waldbronn
Germany
0800 603 1000

e-mail address of person responsible for this SDS : pdl-msds_author@agilent.com

1.4 Emergency telephone number

Emergency telephone number (with hours of operation) : CHEMTREC®: +(44)-870-8200418

Date of issue/Date of revision : 17/10/2016

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SECTION 2: Hazards identification**2.1 Classification of the substance or mixture**

Product definition	: QuikSolution	Mono-constituent substance
	QuikChange Lightning Enzyme	Mixture
	10× QuikChange Lightning Buffer	Mixture
	QuikChange XL dNTP Mix	Mixture
	Dpn I Enzyme	Mixture
	pWS4.5 Control Template	Mixture
	Control Primer 1 (34-mer)	Mixture
	Control Primer 2 (34-mer)	Mixture
	XL10-Gold Ultracompetent cells	Mixture
	XL10-Gold	Mixture
	2-Mercaptoethanol	Mixture
	pUC 18 DNA Control Plasmid	Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]**XL10-Gold 2-Mercaptoethanol**

H318	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
H317	SKIN SENSITISATION - Category 1
H412	LONG-TERM AQUATIC HAZARD - Category 3

Ingredients of unknown toxicity	: QuikChange XL dNTP Mix	Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 5.7%
Ingredients of unknown ecotoxicity	: 10× QuikChange Lightning Buffer	Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 2%
	: QuikChange XL dNTP Mix	Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 5.7%

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements**Hazard pictograms****Signal word**

: QuikSolution	No signal word.
QuikChange Lightning Enzyme	No signal word.
10× QuikChange Lightning Buffer	No signal word.
QuikChange XL dNTP Mix	No signal word.
Dpn I Enzyme	No signal word.
pWS4.5 Control Template	No signal word.
Control Primer 1 (34-mer)	No signal word.
Control Primer 2 (34-mer)	No signal word.
XL10-Gold Ultracompetent cells	No signal word.
XL10-Gold	Danger
2-Mercaptoethanol	No signal word.
pUC 18 DNA Control	No signal word.

SECTION 2: Hazards identification

	Plasmid	
Hazard statements	: QuikSolution	No known significant effects or critical hazards.
	QuikChange Lightning Enzyme	No known significant effects or critical hazards.
	10× QuikChange Lightning Buffer	No known significant effects or critical hazards.
	QuikChange XL dNTP Mix	No known significant effects or critical hazards.
	Dpn I Enzyme	No known significant effects or critical hazards.
	pWS4.5 Control Template	No known significant effects or critical hazards.
	Control Primer 1 (34-mer)	No known significant effects or critical hazards.
	Control Primer 2 (34-mer)	No known significant effects or critical hazards.
	XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
	XL10-Gold 2-Mercaptoethanol	GHS05 - Causes serious eye damage. GHS07 - May cause an allergic skin reaction. Harmful to aquatic life with long lasting effects.
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
	Precautionary statements	
Prevention	: QuikSolution	Not applicable.
	QuikChange Lightning Enzyme	Not applicable.
	10× QuikChange Lightning Buffer	Not applicable.
	QuikChange XL dNTP Mix	Not applicable.
	Dpn I Enzyme	Not applicable.
	pWS4.5 Control Template	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	XL10-Gold Ultracompetent cells	Not applicable.
	XL10-Gold 2-Mercaptoethanol	P280 - Wear protective gloves. Wear eye or face protection. P273 - Avoid release to the environment.
	pUC 18 DNA Control Plasmid	Not applicable.
	Response	: QuikSolution
QuikChange Lightning Enzyme		Not applicable.
10× QuikChange Lightning Buffer		Not applicable.
QuikChange XL dNTP Mix		Not applicable.
Dpn I Enzyme		Not applicable.
pWS4.5 Control Template		Not applicable.
Control Primer 1 (34-mer)		Not applicable.
Control Primer 2 (34-mer)		Not applicable.
XL10-Gold Ultracompetent cells		Not applicable.

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	XL10-Gold 2-Mercaptoethanol	P305 + P351 + P310 - IF IN EYES: Rinse cautiously with water for several minutes. Immediately call a POISON CENTER or physician.
	pUC 18 DNA Control Plasmid	Not applicable.
Storage	: QuikSolution	Not applicable.
	QuikChange Lightning Enzyme	Not applicable.
	10× QuikChange Lightning Buffer	Not applicable.
	QuikChange XL dNTP Mix	Not applicable.
	Dpn I Enzyme	Not applicable.
	pWS4.5 Control Template	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	XL10-Gold Ultracompetent cells	Not applicable.
	XL10-Gold 2-Mercaptoethanol	Not applicable.
	pUC 18 DNA Control Plasmid	Not applicable.
Disposal	: QuikSolution	Not applicable.
	QuikChange Lightning Enzyme	Not applicable.
	10× QuikChange Lightning Buffer	Not applicable.
	QuikChange XL dNTP Mix	Not applicable.
	Dpn I Enzyme	Not applicable.
	pWS4.5 Control Template	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	XL10-Gold Ultracompetent cells	Not applicable.
	XL10-Gold 2-Mercaptoethanol	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
	pUC 18 DNA Control Plasmid	Not applicable.
Hazardous ingredients	: 10× QuikChange Lightning Buffer	Not applicable.
	Dpn I Enzyme	Not applicable.
	XL10-Gold 2-Mercaptoethanol	- 2-Mercaptoethanol
Supplemental label elements	: QuikSolution	Not applicable.
	QuikChange Lightning Enzyme	Not applicable.
	10× QuikChange Lightning Buffer	Safety data sheet available on request.
	QuikChange XL dNTP Mix	Not applicable.
	Dpn I Enzyme	Safety data sheet available on request.
	pWS4.5 Control Template	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2	Not applicable.

SECTION 2: Hazards identification

	(34-mer)	
	XL10-Gold	Not applicable.
	Ultracompetent cells	
	XL10-Gold	Not applicable.
	2-Mercaptoethanol	
	pUC 18 DNA Control	Not applicable.
	Plasmid	
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	QuikSolution	Not applicable.
	QuikChange Lightning Enzyme	Not applicable.
	10× QuikChange Lightning Buffer	Not applicable.
	QuikChange XL dNTP Mix	Not applicable.
	Dpn I Enzyme	Not applicable.
	pWS4.5 Control Template	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	XL10-Gold	Not applicable.
	Ultracompetent cells	
	XL10-Gold	Not applicable.
	2-Mercaptoethanol	
	pUC 18 DNA Control	Not applicable.
	Plasmid	

Special packaging requirements

Tactile warning of danger	QuikSolution	Not applicable.
	QuikChange Lightning Enzyme	Not applicable.
	10× QuikChange Lightning Buffer	Not applicable.
	QuikChange XL dNTP Mix	Not applicable.
	Dpn I Enzyme	Not applicable.
	pWS4.5 Control Template	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	XL10-Gold	Not applicable.
	Ultracompetent cells	
	XL10-Gold	Not applicable.
	2-Mercaptoethanol	
	pUC 18 DNA Control	Not applicable.
	Plasmid	

2.3 Other hazards

Other hazards which do not result in classification	QuikSolution	None known.
	QuikChange Lightning Enzyme	None known.
	10× QuikChange Lightning Buffer	None known.
	QuikChange XL dNTP Mix	None known.
	Dpn I Enzyme	None known.
	pWS4.5 Control Template	None known.
	Control Primer 1 (34-mer)	None known.
	Control Primer 2	None known.

SECTION 2: Hazards identification

(34-mer) XL10-Gold Ultracompetent cells	None known.
XL10-Gold 2-Mercaptoethanol	None known.
pUC 18 DNA Control Plasmid	None known.

SECTION 3: Composition/information on ingredients

3.2 Mixtures	:	QuikSolution	Mono-constituent substance
		QuikChange Lightning Enzyme	Mixture
		10× QuikChange Lightning Buffer	Mixture
		QuikChange XL dNTP Mix	Mixture
		Dpn I Enzyme	Mixture
		pWS4.5 Control Template	Mixture
		Control Primer 1 (34-mer)	Mixture
		Control Primer 2 (34-mer)	Mixture
		XL10-Gold Ultracompetent cells	Mixture
		XL10-Gold 2-Mercaptoethanol	Mixture
		pUC 18 DNA Control Plasmid	Mixture

Product/ingredient name	Identifiers	%	Regulation (EC) No. 1272/2008 [CLP]	Type
QuikSolution Dimethyl sulfoxide	EC: 200-664-3 CAS: 67-68-5	100	Not classified.	[A]
QuikChange Lightning Enzyme Glycerol	EC: 200-289-5 CAS: 56-81-5	≥50 - ≤75	Not classified.	[2]
10× QuikChange Lightning Buffer 2-Amino-2-(hydroxymethyl) propane-1,3-diol hydrochloride	EC: 214-684-5 CAS: 1185-53-1	≤5	Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335	[1]
Dodecyltrimethyl (3-sulphonatopropyl)ammonium	EC: 239-002-3 CAS: 14933-08-5	≤3	Acute Tox. 4, H302 Acute Tox. 4, H312 Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335	[1]
Dpn I Enzyme Glycerol	EC: 200-289-5 CAS: 56-81-5	≥50 - ≤75	Not classified.	[2]
Sodium chloride	EC: 231-598-3 CAS: 7647-14-5	≤3	Eye Irrit. 2, H319	[1]
XL10-Gold Ultracompetent cells Glycerol	EC: 200-289-5 CAS: 56-81-5	≥10 - ≤25	Not classified.	[2]
Sucrose	EC: 200-334-9 CAS: 57-50-1	≤10	Not classified.	[2]
XL10-Gold 2-Mercaptoethanol Sodium chloride	EC: 231-598-3 CAS: 7647-14-5	≥10 - ≤25	Eye Irrit. 2, H319	[1]
2-Mercaptoethanol	EC: 200-464-6 CAS: 60-24-2	≤5	Acute Tox. 3, H301 Acute Tox. 2, H310 Acute Tox. 2, H330 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317	[1]

SECTION 3: Composition/information on ingredients

			STOT SE 3, H335 Aquatic Chronic 2, H411 See Section 16 for the full text of the H statements declared above.
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There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Type

- [1] Substance classified with a health or environmental hazard
- [2] Substance with a workplace exposure limit
- [3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
- [5] Substance of equivalent concern
- [A] Constituent
- [B] Impurity
- [C] Stabilising additive

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact	: QuikSolution	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.
	QuikChange Lightning Enzyme	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.
	10x QuikChange Lightning Buffer	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.
	QuikChange XL dNTP Mix	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.
	Dpn I Enzyme	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.
	pWS4.5 Control Template	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.
	Control Primer 1 (34-mer)	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.
	Control Primer 2 (34-mer)	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 Ultracompetent cells	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.
	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.

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Inhalation	: QuikSolution	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	QuikChange Lightning Enzyme	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	10× QuikChange Lightning Buffer	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	QuikChange XL dNTP Mix	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	Dpn I Enzyme	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	pWS4.5 Control Template	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	Control Primer 1 (34-mer)	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	Control Primer 2 (34-mer)	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	XL10-Gold Ultracompetent cells	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 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.
	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.
Skin contact	: QuikSolution	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	QuikChange Lightning Enzyme	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	10× QuikChange Lightning Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	QuikChange XL dNTP Mix	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	Dpn I Enzyme	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	pWS4.5 Control	Flush contaminated skin with plenty of water. Remove

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Template	contaminated clothing and shoes. Get medical attention if symptoms occur.
Control Primer 1 (34-mer)	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Control Primer 2 (34-mer)	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
XL10-Gold Ultracompetent cells	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.
pUC 18 DNA Control Plasmid	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Ingestion : QuikSolution	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
QuikChange Lightning Enzyme	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
10× QuikChange Lightning Buffer	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
QuikChange XL dNTP Mix	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
Dpn I Enzyme	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
pWS4.5 Control Template	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
Control Primer 1 (34-mer)	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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

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Control Primer 2 (34-mer)	personnel. Get medical attention if symptoms occur. Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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 Ultracompetent cells	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
pUC 18 DNA Control Plasmid	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
Protection of first-aiders : QuikSolution	No action shall be taken involving any personal risk or without suitable training.
QuikChange Lightning Enzyme	No action shall be taken involving any personal risk or without suitable training.
10× QuikChange Lightning Buffer	No action shall be taken involving any personal risk or without suitable training.
QuikChange XL dNTP Mix	No action shall be taken involving any personal risk or without suitable training.
Dpn I Enzyme	No action shall be taken involving any personal risk or without suitable training.
pWS4.5 Control Template	No action shall be taken involving any personal risk or without suitable training.
Control Primer 1 (34-mer)	No action shall be taken involving any personal risk or without suitable training.
Control Primer 2 (34-mer)	No action shall be taken involving any personal risk or without suitable training.
XL10-Gold Ultracompetent cells	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.
pUC 18 DNA Control Plasmid	No action shall be taken involving any personal risk or without suitable training.

4.2 Most important symptoms and effects, both acute and delayed

SECTION 4: First aid measures**Potential acute health effects**

Eye contact	:	QuikSolution	No known significant effects or critical hazards.	
		QuikChange Lightning Enzyme	No known significant effects or critical hazards.	
		10× QuikChange Lightning Buffer	No known significant effects or critical hazards.	
		QuikChange XL dNTP Mix	No known significant effects or critical hazards.	
		Dpn I Enzyme	No known significant effects or critical hazards.	
		pWS4.5 Control Template	No known significant effects or critical hazards.	
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.	
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.	
		XL10-Gold	No known significant effects or critical hazards.	
		Ultracompetent cells	No known significant effects or critical hazards.	
		XL10-Gold	Causes serious eye damage.	
		2-Mercaptoethanol	No known significant effects or critical hazards.	
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	
	Inhalation	:	QuikSolution	No known significant effects or critical hazards.
			QuikChange Lightning Enzyme	No known significant effects or critical hazards.
		10× QuikChange Lightning Buffer	No known significant effects or critical hazards.	
		QuikChange XL dNTP Mix	No known significant effects or critical hazards.	
		Dpn I Enzyme	No known significant effects or critical hazards.	
		pWS4.5 Control Template	No known significant effects or critical hazards.	
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.	
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.	
		XL10-Gold	No known significant effects or critical hazards.	
		Ultracompetent cells	No known significant effects or critical hazards.	
		XL10-Gold	No known significant effects or critical hazards.	
		2-Mercaptoethanol	No known significant effects or critical hazards.	
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	
Skin contact		:	QuikSolution	No known significant effects or critical hazards.
			QuikChange Lightning Enzyme	No known significant effects or critical hazards.
		10× QuikChange Lightning Buffer	No known significant effects or critical hazards.	
		QuikChange XL dNTP Mix	No known significant effects or critical hazards.	
		Dpn I Enzyme	No known significant effects or critical hazards.	
		pWS4.5 Control Template	No known significant effects or critical hazards.	
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.	
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.	
		XL10-Gold	No known significant effects or critical hazards.	
		Ultracompetent cells	No known significant effects or critical hazards.	
		XL10-Gold	May cause an allergic skin reaction.	
		2-Mercaptoethanol	No known significant effects or critical hazards.	
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	

SECTION 4: First aid measures

Ingestion	:	QuikSolution	No known significant effects or critical hazards.
		QuikChange Lightning Enzyme	No known significant effects or critical hazards.
		10× QuikChange Lightning Buffer	No known significant effects or critical hazards.
		QuikChange XL dNTP Mix	No known significant effects or critical hazards.
		Dpn I Enzyme	No known significant effects or critical hazards.
		pWS4.5 Control Template	No known significant effects or critical hazards.
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.
		XL10-Gold	No known significant effects or critical hazards.
		Ultracompetent cells	No known significant effects or critical hazards.
		XL10-Gold	No known significant effects or critical hazards.
		2-Mercaptoethanol	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact	:	QuikSolution	No specific data.
		QuikChange Lightning Enzyme	No specific data.
		10× QuikChange Lightning Buffer	No specific data.
		QuikChange XL dNTP Mix	No specific data.
		Dpn I Enzyme	No specific data.
		pWS4.5 Control Template	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		XL10-Gold	No specific data.
		Ultracompetent cells	No specific data.
		XL10-Gold	Adverse symptoms may include the following:
		2-Mercaptoethanol	pain watering redness
		pUC 18 DNA Control Plasmid	No specific data.

Inhalation	:	QuikSolution	No specific data.
		QuikChange Lightning Enzyme	No specific data.
		10× QuikChange Lightning Buffer	No specific data.
		QuikChange XL dNTP Mix	No specific data.
		Dpn I Enzyme	No specific data.
		pWS4.5 Control Template	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		XL10-Gold	No specific data.
		Ultracompetent cells	No specific data.
		XL10-Gold	No specific data.
		2-Mercaptoethanol	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.

SECTION 4: First aid measures

Skin contact	:	QuikSolution	No specific data.
		QuikChange Lightning Enzyme	No specific data.
		10× QuikChange Lightning Buffer	No specific data.
		QuikChange XL dNTP Mix	No specific data.
		Dpn I Enzyme	No specific data.
		pWS4.5 Control Template	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		XL10-Gold	No specific data.
		Ultracompetent cells	Adverse symptoms may include the following:
		XL10-Gold 2-Mercaptoethanol	
			pain or irritation
			redness
			blistering may occur
		pUC 18 DNA Control Plasmid	No specific data.
Ingestion	:	QuikSolution	No specific data.
		QuikChange Lightning Enzyme	No specific data.
		10× QuikChange Lightning Buffer	No specific data.
		QuikChange XL dNTP Mix	No specific data.
		Dpn I Enzyme	No specific data.
		pWS4.5 Control Template	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		XL10-Gold	No specific data.
		Ultracompetent cells	Adverse symptoms may include the following:
		XL10-Gold 2-Mercaptoethanol	
			stomach pains
		pUC 18 DNA Control Plasmid	No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	:	QuikSolution	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		QuikChange Lightning Enzyme	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		10× QuikChange Lightning Buffer	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
		QuikChange XL dNTP Mix	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
		Dpn I Enzyme	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		pWS4.5 Control Template	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		Control Primer 1 (34-mer)	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		Control Primer 2 (34-mer)	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

SECTION 4: First aid measures

Specific treatments	:	XL10-Gold	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		Ultracompetent cells	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		XL10-Gold	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		2-Mercaptoethanol	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		pUC 18 DNA Control	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		Plasmid	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		QuikSolution	No specific treatment.
		QuikChange Lightning Enzyme	No specific treatment.
		10× QuikChange Lightning Buffer	No specific treatment.
		QuikChange XL dNTP Mix	No specific treatment.
		Dpn I Enzyme	No specific treatment.
		pWS4.5 Control Template	No specific treatment.
		Control Primer 1 (34-mer)	No specific treatment.
		Control Primer 2 (34-mer)	No specific treatment.
		XL10-Gold	No specific treatment.
		Ultracompetent cells	No specific treatment.
XL10-Gold	No specific treatment.		
2-Mercaptoethanol	No specific treatment.		
pUC 18 DNA Control	No specific treatment.		
Plasmid	No specific treatment.		

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	QuikSolution	Use an extinguishing agent suitable for the surrounding fire.
		QuikChange Lightning Enzyme	Use an extinguishing agent suitable for the surrounding fire.
		10× QuikChange Lightning Buffer	Use an extinguishing agent suitable for the surrounding fire.
		QuikChange XL dNTP Mix	Use an extinguishing agent suitable for the surrounding fire.
		Dpn I Enzyme	Use an extinguishing agent suitable for the surrounding fire.
		pWS4.5 Control Template	Use an extinguishing agent suitable for the surrounding fire.
		Control Primer 1 (34-mer)	Use an extinguishing agent suitable for the surrounding fire.
		Control Primer 2 (34-mer)	Use an extinguishing agent suitable for the surrounding fire.
		XL10-Gold	Use an extinguishing agent suitable for the surrounding fire.
		Ultracompetent cells	Use an extinguishing agent suitable for the surrounding fire.
		XL10-Gold	Use an extinguishing agent suitable for the surrounding fire.
		2-Mercaptoethanol	Use an extinguishing agent suitable for the surrounding fire.
		pUC 18 DNA Control	Use an extinguishing agent suitable for the surrounding fire.
		Plasmid	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	:	QuikSolution	None known.
		QuikChange Lightning Enzyme	None known.
		10× QuikChange Lightning Buffer	None known.
		QuikChange XL dNTP Mix	None known.
		Dpn I Enzyme	None known.
		pWS4.5 Control Template	None known.
		Control Primer 1 (34-mer)	None known.
		Control Primer 2 (34-mer)	None known.

SECTION 5: Firefighting measures

XL10-Gold Ultracompetent cells	None known.
XL10-Gold 2-Mercaptoethanol	None known.
pUC 18 DNA Control Plasmid	None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture

: QuikSolution	In a fire or if heated, a pressure increase will occur and the container may burst.
QuikChange Lightning Enzyme	In a fire or if heated, a pressure increase will occur and the container may burst.
10× QuikChange Lightning Buffer	In a fire or if heated, a pressure increase will occur and the container may burst.
QuikChange XL dNTP Mix	In a fire or if heated, a pressure increase will occur and the container may burst.
Dpn I Enzyme	In a fire or if heated, a pressure increase will occur and the container may burst.
pWS4.5 Control Template	In a fire or if heated, a pressure increase will occur and the container may burst.
Control Primer 1 (34-mer)	In a fire or if heated, a pressure increase will occur and the container may burst.
Control Primer 2 (34-mer)	In a fire or if heated, a pressure increase will occur and the container may burst.
XL10-Gold Ultracompetent cells	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.

Hazardous combustion products

: QuikSolution	In a fire or if heated, a pressure increase will occur and the container may burst.
QuikChange Lightning Enzyme	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides
10× QuikChange Lightning Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide
QuikChange XL dNTP Mix	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides sulfur oxides halogenated compounds metal oxide/oxides
Dpn I Enzyme	Decomposition products may include the following materials: carbon dioxide carbon monoxide halogenated compounds metal oxide/oxides
pWS4.5 Control Template	No specific data.
Control Primer 1	No specific data.

SECTION 5: Firefighting measures

(34-mer) Control Primer 2	No specific data.
(34-mer) XL10-Gold Ultracompetent cells	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides
XL10-Gold 2-Mercaptoethanol	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides
pUC 18 DNA Control Plasmid	No specific data.

5.3 Advice for firefighters

Special precautions for fire-fighters

: QuikSolution	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.
QuikChange Lightning Enzyme	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.
10× QuikChange Lightning Buffer	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.
QuikChange XL dNTP Mix	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.
Dpn I Enzyme	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.
pWS4.5 Control Template	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.
Control Primer 1 (34-mer)	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.
Control Primer 2 (34-mer)	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 Ultracompetent 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.
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.
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.

Special protective equipment for fire-fighters

: QuikSolution	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
QuikChange Lightning Enzyme	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for

SECTION 5: Firefighting measures

10× QuikChange Lightning Buffer	fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
QuikChange XL dNTP Mix	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
Dpn I Enzyme	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
pWS4.5 Control Template	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
Control Primer 1 (34-mer)	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
Control Primer 2 (34-mer)	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
XL10-Gold Ultracompetent cells	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

For non-emergency personnel	: QuikSolution	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 spilt material. Put on appropriate personal protective equipment.
	QuikChange Lightning Enzyme	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 spilt material. Put on appropriate personal protective equipment.
	10× QuikChange Lightning Buffer	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 spilt material. Put on appropriate personal protective equipment.
	QuikChange XL dNTP Mix	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 spilt material. Put on appropriate personal protective equipment.
	Dpn I Enzyme	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 spilt material. Put on appropriate personal protective equipment.
	pWS4.5 Control Template	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 spilt material. Put on appropriate personal protective equipment.
	Control Primer 1 (34-mer)	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 spilt material. Put on appropriate personal protective equipment.
	Control Primer 2 (34-mer)	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 spilt material. Put on appropriate personal protective equipment.
	XL10-Gold Ultracompetent 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 spilt 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 spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
	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 spilt material. Put on appropriate personal protective equipment.

SECTION 6: Accidental release measures

For emergency responders	: QuikSolution	If specialised 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".
	QuikChange Lightning Enzyme	If specialised 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".
	10× QuikChange Lightning Buffer	If specialised 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".
	QuikChange XL dNTP Mix	If specialised 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".
	Dpn I Enzyme	If specialised 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".
	pWS4.5 Control Template	If specialised 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".
	Control Primer 1 (34-mer)	If specialised 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".
	Control Primer 2 (34-mer)	If specialised 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 Ultracompetent cells	If specialised 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 specialised 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".
	pUC 18 DNA Control Plasmid	If specialised 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".
6.2 Environmental precautions	: QuikSolution	Avoid dispersal of spilt 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).
	QuikChange Lightning Enzyme	Avoid dispersal of spilt 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).
	10× QuikChange Lightning Buffer	Avoid dispersal of spilt 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).
	QuikChange XL dNTP Mix	Avoid dispersal of spilt 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).
	Dpn I Enzyme	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution

SECTION 6: Accidental release measures

pWS4.5 Control Template	(sewers, waterways, soil or air). Avoid dispersal of spilt 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).
Control Primer 1 (34-mer)	Avoid dispersal of spilt 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).
Control Primer 2 (34-mer)	Avoid dispersal of spilt 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 Ultracompetent cells	Avoid dispersal of spilt 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 spilt 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.
pUC 18 DNA Control Plasmid	Avoid dispersal of spilt 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 material for containment and cleaning up

Methods for cleaning up : QuikSolution

QuikChange Lightning Enzyme	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.
10x QuikChange Lightning Buffer	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.
QuikChange XL dNTP Mix	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.
Dpn I Enzyme	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.
pWS4.5 Control Template	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.
Control Primer 1 (34-mer)	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 6: Accidental release measures

Control Primer 2 (34-mer)	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 Ultracompetent 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.
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.
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.

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage**7.1 Precautions for safe handling**

Protective measures	: QuikSolution	Put on appropriate personal protective equipment (see Section 8).
	QuikChange Lightning Enzyme	Put on appropriate personal protective equipment (see Section 8).
	10× QuikChange Lightning Buffer	Put on appropriate personal protective equipment (see Section 8).
	QuikChange XL dNTP Mix	Put on appropriate personal protective equipment (see Section 8).
	Dpn I Enzyme	Put on appropriate personal protective equipment (see Section 8).
	pWS4.5 Control Template	Put on appropriate personal protective equipment (see Section 8).
	Control Primer 1 (34-mer)	Put on appropriate personal protective equipment (see Section 8).
	Control Primer 2 (34-mer)	Put on appropriate personal protective equipment (see Section 8).
	XL10-Gold Ultracompetent cells	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. Do not get in eyes or on skin or clothing. Do not breathe vapour 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.
	pUC 18 DNA Control Plasmid	Put on appropriate personal protective equipment (see Section 8).

SECTION 7: Handling and storage**Advice on general occupational hygiene**

: QuikSolution	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.
QuikChange Lightning Enzyme	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.
10× QuikChange Lightning Buffer	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.
QuikChange XL dNTP Mix	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.
Dpn I Enzyme	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.
pWS4.5 Control Template	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.
Control Primer 1 (34-mer)	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.
Control Primer 2 (34-mer)	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 Ultracompetent cells	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.
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 contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
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,

SECTION 7: Handling and storage

drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities**Storage**

: QuikSolution

Storage temperature: -20°C (-4°F). 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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

QuikChange Lightning Enzyme

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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

10× QuikChange Lightning Buffer

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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

QuikChange XL dNTP Mix

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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

Dpn I Enzyme

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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

pWS4.5 Control Template

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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

Control Primer 1 (34-mer)

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

SECTION 7: Handling and storage

	been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.
Control Primer 2 (34-mer)	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 unlabelled containers. Use appropriate containment to avoid environmental contamination.
XL10-Gold Ultracompetent 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 unlabelled containers. Use appropriate containment to avoid environmental contamination.
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 unlabelled containers. Use appropriate containment to avoid environmental contamination.
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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

7.3 Specific end use(s)**Recommendations**

QuikSolution	Industrial applications, Professional applications.
QuikChange Lightning Enzyme	Industrial applications, Professional applications.
10× QuikChange Lightning Buffer	Industrial applications, Professional applications.
QuikChange XL dNTP Mix	Industrial applications, Professional applications.
Dpn I Enzyme	Industrial applications, Professional applications.
pWS4.5 Control Template	Industrial applications, Professional applications.
Control Primer 1 (34-mer)	Industrial applications, Professional applications.
Control Primer 2 (34-mer)	Industrial applications, Professional applications.
XL10-Gold Ultracompetent cells	Industrial applications, Professional applications.
XL10-Gold 2-Mercaptoethanol	Industrial applications, Professional applications.
pUC 18 DNA Control Plasmid	Industrial applications, Professional applications.

SECTION 7: Handling and storage

Industrial sector specific solutions	QuikSolution	Not applicable.
	QuikChange Lightning Enzyme	Not applicable.
	10× QuikChange Lightning Buffer	Not applicable.
	QuikChange XL dNTP Mix	Not applicable.
	Dpn I Enzyme	Not applicable.
	pWS4.5 Control Template	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	XL10-Gold Ultracompetent cells	Not applicable.
	XL10-Gold 2-Mercaptoethanol	Not applicable.
	pUC 18 DNA Control Plasmid	Not applicable.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
QuikChange Lightning Enzyme Glycerol	EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 10 mg/m ³ 8 hours. Form: Mist
Dpn I Enzyme Glycerol	EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 10 mg/m ³ 8 hours. Form: Mist
XL10-Gold Ultracompetent cells Glycerol	EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 10 mg/m ³ 8 hours. Form: Mist
Sucrose	EH40/2005 WELs (United Kingdom (UK), 12/2011). STEL: 20 mg/m ³ 15 minutes. TWA: 10 mg/m ³ 8 hours.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

No DNELs/DMELs available.

PNECs

No PNECs available

8.2 Exposure controls

SECTION 8: Exposure controls/personal protection

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapour 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.

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 and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

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.

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.

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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	: QuikSolution	Liquid. [Clear.]
	QuikChange Lightning Enzyme	Liquid.
	10× QuikChange Lightning Buffer	Liquid.
	QuikChange XL dNTP Mix	Liquid.
	Dpn I Enzyme	Liquid.
	pWS4.5 Control Template	Liquid.
	Control Primer 1 (34-mer)	Liquid.
	Control Primer 2 (34-mer)	Liquid.
	XL10-Gold Ultracompetent cells	Liquid.
	XL10-Gold 2-Mercaptoethanol	Liquid.
	pUC 18 DNA Control Plasmid	Liquid.

SECTION 9: Physical and chemical properties

Colour	:	QuikSolution	Colourless.	
		QuikChange Lightning Enzyme	Not available.	
		10× QuikChange Lightning Buffer	Not available.	
		QuikChange XL dNTP Mix	Not available.	
		Dpn I Enzyme	Not available.	
		pWS4.5 Control Template	Not available.	
		Control Primer 1 (34-mer)	Not available.	
		Control Primer 2 (34-mer)	Not available.	
		XL10-Gold	Not available.	
		Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol	Not available.	
		pUC 18 DNA Control Plasmid	Not available.	
	Odour	:	QuikSolution	Slight [Slight]
			QuikChange Lightning Enzyme	Not available.
			10× QuikChange Lightning Buffer	Not available.
			QuikChange XL dNTP Mix	Not available.
			Dpn I Enzyme	Not available.
			pWS4.5 Control Template	Not available.
			Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.	
		XL10-Gold	Not available.	
		Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol	Not available.	
		pUC 18 DNA Control Plasmid	Not available.	
Odour threshold		:	QuikSolution	Not available.
			QuikChange Lightning Enzyme	Not available.
			10× QuikChange Lightning Buffer	Not available.
			QuikChange XL dNTP Mix	Not available.
			Dpn I Enzyme	Not available.
			pWS4.5 Control Template	Not available.
			Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.	
		XL10-Gold	Not available.	
		Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol	Not available.	
		pUC 18 DNA Control Plasmid	Not available.	

SECTION 9: Physical and chemical properties

pH	:	QuikSolution	Not available.	
		QuikChange Lightning Enzyme	8.2	
		10× QuikChange Lightning Buffer	Not available.	
		QuikChange XL dNTP Mix	Not available.	
		Dpn I Enzyme	Not available.	
		pWS4.5 Control Template	7.5	
		Control Primer 1 (34-mer)	7.5	
		Control Primer 2 (34-mer)	7.5	
		XL10-Gold Ultracompetent cells	6.4	
		XL10-Gold	Not available.	
		2-Mercaptoethanol		
		pUC 18 DNA Control Plasmid	7.5	
	Melting point/freezing point	:	QuikSolution	18.4°C
			QuikChange Lightning Enzyme	Not available.
			10× QuikChange Lightning Buffer	Not available.
			QuikChange XL dNTP Mix	Not available.
			Dpn I Enzyme	Not available.
			pWS4.5 Control Template	0°C
			Control Primer 1 (34-mer)	0°C
			Control Primer 2 (34-mer)	0°C
		XL10-Gold Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol		
		pUC 18 DNA Control Plasmid	0°C	
Initial boiling point and boiling range		:	QuikSolution	188.8°C
			QuikChange Lightning Enzyme	Not available.
			10× QuikChange Lightning Buffer	Not available.
			QuikChange XL dNTP Mix	Not available.
			Dpn I Enzyme	Not available.
			pWS4.5 Control Template	100°C
			Control Primer 1 (34-mer)	100°C
			Control Primer 2 (34-mer)	100°C
		XL10-Gold Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol		
		pUC 18 DNA Control Plasmid	100°C	

SECTION 9: Physical and chemical properties

Flash point	: QuikSolution	Closed cup: 85°C Open cup: 87°C	
	QuikChange Lightning Enzyme	Not available.	
	10× QuikChange Lightning Buffer	Not available.	
	QuikChange XL dNTP Mix	Not available.	
	Dpn I Enzyme	Not available.	
	pWS4.5 Control Template	Not available.	
	Control Primer 1 (34-mer)	Not available.	
	Control Primer 2 (34-mer)	Not available.	
	XL10-Gold	Not available.	
	Ultracompetent cells XL10-Gold	Not available.	
	2-Mercaptoethanol	Not available.	
	pUC 18 DNA Control Plasmid	Not available.	
	Evaporation rate	: QuikSolution	0.026 (butyl acetate = 1)
		QuikChange Lightning Enzyme	Not available.
		10× QuikChange Lightning Buffer	Not available.
		QuikChange XL dNTP Mix	Not available.
		Dpn I Enzyme	Not available.
pWS4.5 Control Template		Not available.	
Control Primer 1 (34-mer)		Not available.	
Control Primer 2 (34-mer)		Not available.	
XL10-Gold		Not available.	
Ultracompetent cells XL10-Gold		Not available.	
2-Mercaptoethanol		Not available.	
pUC 18 DNA Control Plasmid		Not available.	
Flammability (solid, gas)		: QuikSolution	Not applicable.
		QuikChange Lightning Enzyme	Not applicable.
		10× QuikChange Lightning Buffer	Not applicable.
		QuikChange XL dNTP Mix	Not applicable.
		Dpn I Enzyme	Not applicable.
	pWS4.5 Control Template	Not applicable.	
	Control Primer 1 (34-mer)	Not applicable.	
	Control Primer 2 (34-mer)	Not applicable.	
	XL10-Gold	Not applicable.	
	Ultracompetent cells XL10-Gold	Not applicable.	
	2-Mercaptoethanol	Not applicable.	
	pUC 18 DNA Control Plasmid	Not applicable.	

SECTION 9: Physical and chemical properties

Upper/lower flammability or explosive limits	:	QuikSolution	Lower: 2.6%		
			Upper: 42%		
		QuikChange Lightning Enzyme	Not available.		
		10× QuikChange Lightning Buffer	Not available.		
		QuikChange XL dNTP Mix	Not available.		
		Dpn I Enzyme	Not available.		
		pWS4.5 Control Template	Not available.		
		Control Primer 1 (34-mer)	Not available.		
		Control Primer 2 (34-mer)	Not available.		
		XL10-Gold	Not available.		
		Ultracompetent cells	Not available.		
		XL10-Gold	Not available.		
		2-Mercaptoethanol	Not available.		
		pUC 18 DNA Control Plasmid	Not available.		
		Vapour pressure	:	QuikSolution	0.056 kPa [room temperature]
				QuikChange Lightning Enzyme	Not available.
10× QuikChange Lightning Buffer	Not available.				
QuikChange XL dNTP Mix	Not available.				
Dpn I Enzyme	Not available.				
pWS4.5 Control Template	Not available.				
Control Primer 1 (34-mer)	Not available.				
Control Primer 2 (34-mer)	Not available.				
XL10-Gold	Not available.				
Ultracompetent cells	Not available.				
XL10-Gold	Not available.				
2-Mercaptoethanol	Not available.				
pUC 18 DNA Control Plasmid	Not available.				
Vapour density	:			QuikSolution	2.71 [Air = 1]
				QuikChange Lightning Enzyme	Not available.
				10× QuikChange Lightning Buffer	Not available.
		QuikChange XL dNTP Mix	Not available.		
		Dpn I Enzyme	Not available.		
		pWS4.5 Control Template	Not available.		
		Control Primer 1 (34-mer)	Not available.		
		Control Primer 2 (34-mer)	Not available.		
		XL10-Gold	Not available.		
		Ultracompetent cells	Not available.		
		XL10-Gold	Not available.		
		2-Mercaptoethanol	Not available.		
		pUC 18 DNA Control Plasmid	Not available.		

SECTION 9: Physical and chemical properties

Relative density	:	QuikSolution	1.1	
		QuikChange Lightning Enzyme	Not available.	
		10× QuikChange Lightning Buffer	Not available.	
		QuikChange XL dNTP Mix	Not available.	
		Dpn I Enzyme	Not available.	
		pWS4.5 Control Template	Not available.	
		Control Primer 1 (34-mer)	Not available.	
		Control Primer 2 (34-mer)	Not available.	
		XL10-Gold	Not available.	
		Ultracompetent cells XL10-Gold	Not available.	
		2-Mercaptoethanol	Not available.	
		pUC 18 DNA Control Plasmid	Not available.	
	Solubility(ies)	:	QuikSolution	Easily soluble in the following materials: cold water and hot water.
			QuikChange Lightning Enzyme	Soluble in the following materials: cold water and hot water.
			10× QuikChange Lightning Buffer	Easily soluble in the following materials: cold water and hot water.
			QuikChange XL dNTP Mix	Easily soluble in the following materials: cold water and hot water.
			Dpn I Enzyme	Soluble in the following materials: cold water and hot water.
		pWS4.5 Control Template	Easily soluble in the following materials: cold water and hot water.	
		Control Primer 1 (34-mer)	Easily soluble in the following materials: cold water and hot water.	
		Control Primer 2 (34-mer)	Easily soluble in the following materials: cold water and hot water.	
		XL10-Gold	Soluble in the following materials: cold water and hot water.	
		Ultracompetent cells XL10-Gold	Easily soluble in the following materials: cold water and hot water.	
		2-Mercaptoethanol	Easily soluble in the following materials: cold water and hot water.	
		pUC 18 DNA Control Plasmid	Easily soluble in the following materials: cold water and hot water.	
Partition coefficient: n-octanol/water		:	QuikSolution	-2.029
			QuikChange Lightning Enzyme	Not available.
			10× QuikChange Lightning Buffer	Not available.
			QuikChange XL dNTP Mix	Not available.
			Dpn I Enzyme	Not available.
		pWS4.5 Control Template	Not available.	
		Control Primer 1 (34-mer)	Not available.	
		Control Primer 2 (34-mer)	Not available.	
		XL10-Gold	Not available.	
		Ultracompetent cells XL10-Gold	Not available.	
		2-Mercaptoethanol	Not available.	
		pUC 18 DNA Control Plasmid	Not available.	

SECTION 9: Physical and chemical properties

Auto-ignition temperature	:	QuikSolution	300 to 302°C		
		QuikChange Lightning Enzyme	Not available.		
		10× QuikChange Lightning Buffer	Not available.		
		QuikChange XL dNTP Mix	Not available.		
		Dpn I Enzyme	Not available.		
		pWS4.5 Control Template	Not available.		
		Control Primer 1 (34-mer)	Not available.		
		Control Primer 2 (34-mer)	Not available.		
		XL10-Gold Ultracompetent cells	Not available.		
		XL10-Gold 2-Mercaptoethanol	Not available.		
		pUC 18 DNA Control Plasmid	Not available.		
		Decomposition temperature	:	QuikSolution	140 to 189°C
				QuikChange Lightning Enzyme	Not available.
				10× QuikChange Lightning Buffer	Not available.
				QuikChange XL dNTP Mix	Not available.
				Dpn I Enzyme	Not available.
				pWS4.5 Control Template	Not available.
Control Primer 1 (34-mer)	Not available.				
Control Primer 2 (34-mer)	Not available.				
XL10-Gold Ultracompetent cells	Not available.				
XL10-Gold 2-Mercaptoethanol	Not available.				
pUC 18 DNA Control Plasmid	Not available.				
Viscosity	:			QuikSolution	Dynamic (room temperature): 2.14 mPa·s
				QuikChange Lightning Enzyme	Not available.
				10× QuikChange Lightning Buffer	Not available.
				QuikChange XL dNTP Mix	Not available.
				Dpn I Enzyme	Not available.
				pWS4.5 Control Template	Not available.
		Control Primer 1 (34-mer)	Not available.		
		Control Primer 2 (34-mer)	Not available.		
		XL10-Gold Ultracompetent cells	Not available.		
		XL10-Gold 2-Mercaptoethanol	Not available.		
		pUC 18 DNA Control Plasmid	Not available.		

SECTION 9: Physical and chemical properties

Explosive properties	:	QuikSolution	Not available.	
		QuikChange Lightning Enzyme	Not available.	
		10× QuikChange Lightning Buffer	Not available.	
		QuikChange XL dNTP Mix	Not available.	
		Dpn I Enzyme	Not available.	
		pWS4.5 Control Template	Not available.	
		Control Primer 1 (34-mer)	Not available.	
		Control Primer 2 (34-mer)	Not available.	
		XL10-Gold	Not available.	
		Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol	Not available.	
		pUC 18 DNA Control Plasmid	Not available.	
	Oxidising properties	:	QuikSolution	Not available.
			QuikChange Lightning Enzyme	Not available.
			10× QuikChange Lightning Buffer	Not available.
			QuikChange XL dNTP Mix	Not available.
			Dpn I Enzyme	Not available.
			pWS4.5 Control Template	Not available.
			Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.	
		XL10-Gold	Not available.	
		Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol	Not available.	
		pUC 18 DNA Control Plasmid	Not available.	

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	:	QuikSolution	No specific test data related to reactivity available for this product or its ingredients.
		QuikChange Lightning Enzyme	No specific test data related to reactivity available for this product or its ingredients.
		10× QuikChange Lightning Buffer	No specific test data related to reactivity available for this product or its ingredients.
		QuikChange XL dNTP Mix	No specific test data related to reactivity available for this product or its ingredients.
		Dpn I Enzyme	No specific test data related to reactivity available for this product or its ingredients.
		pWS4.5 Control Template	No specific test data related to reactivity available for this product or its ingredients.
		Control Primer 1 (34-mer)	No specific test data related to reactivity available for this product or its ingredients.
		Control Primer 2 (34-mer)	No specific test data related to reactivity available for this product or its ingredients.
		XL10-Gold	No specific test data related to reactivity available for this product or its ingredients.
		Ultracompetent cells	No specific test data related to reactivity available for this product or its ingredients.

SECTION 10: Stability and reactivity

XL10-Gold
2-Mercaptoethanol
pUC 18 DNA Control
Plasmid

No specific test data related to reactivity available for this product or its ingredients.
No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability

: QuikSolution The product is stable.
QuikChange Lightning The product is stable.
Enzyme
10× QuikChange The product is stable.
Lightning Buffer
QuikChange XL dNTP The product is stable.
Mix
Dpn I Enzyme The product is stable.
pWS4.5 Control The product is stable.
Template
Control Primer 1 The product is stable.
(34-mer)
Control Primer 2 The product is stable.
(34-mer)
XL10-Gold The product is stable.
Ultracompetent cells
XL10-Gold The product is stable.
2-Mercaptoethanol
pUC 18 DNA Control The product is stable.
Plasmid

10.3 Possibility of hazardous reactions

: QuikSolution Under normal conditions of storage and use, hazardous reactions will not occur.
QuikChange Lightning Under normal conditions of storage and use, hazardous reactions will not occur.
Enzyme
10× QuikChange Under normal conditions of storage and use, hazardous reactions will not occur.
Lightning Buffer
QuikChange XL dNTP Under normal conditions of storage and use, hazardous reactions will not occur.
Mix
Dpn I Enzyme Under normal conditions of storage and use, hazardous reactions will not occur.
pWS4.5 Control Under normal conditions of storage and use, hazardous reactions will not occur.
Template
Control Primer 1 Under normal conditions of storage and use, hazardous reactions will not occur.
(34-mer)
Control Primer 2 Under normal conditions of storage and use, hazardous reactions will not occur.
(34-mer)
XL10-Gold Under normal conditions of storage and use, hazardous reactions will not occur.
Ultracompetent cells
XL10-Gold Under normal conditions of storage and use, hazardous reactions will not occur.
2-Mercaptoethanol
pUC 18 DNA Control Under normal conditions of storage and use, hazardous reactions will not occur.
Plasmid

10.4 Conditions to avoid

: QuikSolution No specific data.
QuikChange Lightning No specific data.
Enzyme
10× QuikChange No specific data.
Lightning Buffer
QuikChange XL dNTP No specific data.
Mix
Dpn I Enzyme No specific data.
pWS4.5 Control No specific data.
Template
Control Primer 1 No specific data.
(34-mer)
Control Primer 2 No specific data.
(34-mer)

SECTION 10: Stability and reactivity

XL10-Gold Ultracompetent cells	No specific data.
XL10-Gold 2-Mercaptoethanol	No specific data.
pUC 18 DNA Control Plasmid	No specific data.

10.5 Incompatible materials

: QuikSolution	May react or be incompatible with oxidising materials.
QuikChange Lightning Enzyme	May react or be incompatible with oxidising materials.
10× QuikChange Lightning Buffer	May react or be incompatible with oxidising materials.
QuikChange XL dNTP Mix	May react or be incompatible with oxidising materials.
Dpn I Enzyme	May react or be incompatible with oxidising materials.
pWS4.5 Control Template	May react or be incompatible with oxidising materials.
Control Primer 1 (34-mer)	May react or be incompatible with oxidising materials.
Control Primer 2 (34-mer)	May react or be incompatible with oxidising materials.
XL10-Gold Ultracompetent cells	May react or be incompatible with oxidising materials.
XL10-Gold	May react or be incompatible with oxidising materials.
2-Mercaptoethanol pUC 18 DNA Control Plasmid	May react or be incompatible with oxidising materials.

10.6 Hazardous decomposition products

: QuikSolution	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
QuikChange Lightning Enzyme	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
10× QuikChange Lightning Buffer	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
QuikChange XL dNTP Mix	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Dpn I Enzyme	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
pWS4.5 Control Template	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Control Primer 1 (34-mer)	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Control Primer 2 (34-mer)	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
XL10-Gold Ultracompetent cells	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
XL10-Gold	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
2-Mercaptoethanol	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
pUC 18 DNA Control Plasmid	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

SECTION 11: Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
QuikSolution Dimethyl sulfoxide	LD50 Dermal LD50 Oral	Rat Rat	40000 mg/kg 14500 mg/kg	- -
Dpn I Enzyme Sodium chloride	LD50 Oral	Rat	3000 mg/kg	-
XL10-Gold 2-Mercaptoethanol Sodium chloride 2-Mercaptoethanol	LD50 Oral LD50 Dermal LD50 Oral	Rat Rabbit Rat	3000 mg/kg 200 mg/kg 244 mg/kg	- - -

Acute toxicity estimates

Route	ATE value
10× QuikChange Lightning Buffer Oral Dermal Inhalation (vapours)	25000 mg/kg 55000 mg/kg 550 mg/l
XL10-Gold Ultracompetent cells Oral	31250 mg/kg
XL10-Gold 2-Mercaptoethanol Oral Dermal Inhalation (vapours)	5545.5 mg/kg 4545.5 mg/kg 45.45 mg/l

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
QuikSolution Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	100 milligrams	-
Dpn I Enzyme Sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
XL10-Gold 2-Mercaptoethanol Sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 milligrams	-

Sensitiser

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

SECTION 11: Toxicological information

Product/ingredient name	Category	Route of exposure	Target organs
10× QuikChange Lightning Buffer 2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	Category 3	Not applicable.	Respiratory tract irritation
Dodecyldimethyl(3-sulphonatopropyl)ammonium	Category 3	Not applicable.	Respiratory tract irritation
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on likely routes of exposure

QuikSolution	Routes of entry anticipated: Oral, Dermal, Inhalation.
QuikChange Lightning Enzyme	Routes of entry anticipated: Oral, Dermal, Inhalation.
10× QuikChange Lightning Buffer	Routes of entry anticipated: Oral, Dermal, Inhalation.
QuikChange XL dNTP Mix	Not available.
Dpn I Enzyme	Routes of entry anticipated: Oral, Dermal, Inhalation.
pWS4.5 Control Template	Not available.
Control Primer 1 (34-mer)	Not available.
Control Primer 2 (34-mer)	Not available.
XL10-Gold Ultracompetent cells	Routes of entry anticipated: Oral, Dermal, Inhalation.
XL10-Gold 2-Mercaptoethanol	Routes of entry anticipated: Oral, Dermal, Inhalation.
pUC 18 DNA Control Plasmid	Not available.

Potential acute health effects

Inhalation

QuikSolution	No known significant effects or critical hazards.
QuikChange Lightning Enzyme	No known significant effects or critical hazards.
10× QuikChange Lightning Buffer	No known significant effects or critical hazards.
QuikChange XL dNTP Mix	No known significant effects or critical hazards.
Dpn I Enzyme	No known significant effects or critical hazards.
pWS4.5 Control Template	No known significant effects or critical hazards.
Control Primer 1 (34-mer)	No known significant effects or critical hazards.
Control Primer 2 (34-mer)	No known significant effects or critical hazards.
XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.

SECTION 11: Toxicological information

Ingestion	:	QuikSolution	No known significant effects or critical hazards.	
		QuikChange Lightning Enzyme	No known significant effects or critical hazards.	
		10× QuikChange Lightning Buffer	No known significant effects or critical hazards.	
		QuikChange XL dNTP Mix	No known significant effects or critical hazards.	
		Dpn I Enzyme	No known significant effects or critical hazards.	
		pWS4.5 Control Template	No known significant effects or critical hazards.	
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.	
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.	
		XL10-Gold	No known significant effects or critical hazards.	
		Ultracompetent cells	No known significant effects or critical hazards.	
		XL10-Gold	No known significant effects or critical hazards.	
		2-Mercaptoethanol	No known significant effects or critical hazards.	
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	
	Skin contact	:	QuikSolution	No known significant effects or critical hazards.
			QuikChange Lightning Enzyme	No known significant effects or critical hazards.
			10× QuikChange Lightning Buffer	No known significant effects or critical hazards.
		QuikChange XL dNTP Mix	No known significant effects or critical hazards.	
		Dpn I Enzyme	No known significant effects or critical hazards.	
		pWS4.5 Control Template	No known significant effects or critical hazards.	
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.	
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.	
		XL10-Gold	No known significant effects or critical hazards.	
		Ultracompetent cells	No known significant effects or critical hazards.	
		XL10-Gold	May cause an allergic skin reaction.	
		2-Mercaptoethanol	No known significant effects or critical hazards.	
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	
Eye contact		:	QuikSolution	No known significant effects or critical hazards.
			QuikChange Lightning Enzyme	No known significant effects or critical hazards.
			10× QuikChange Lightning Buffer	No known significant effects or critical hazards.
		QuikChange XL dNTP Mix	No known significant effects or critical hazards.	
		Dpn I Enzyme	No known significant effects or critical hazards.	
		pWS4.5 Control Template	No known significant effects or critical hazards.	
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.	
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.	
		XL10-Gold	No known significant effects or critical hazards.	
		Ultracompetent cells	No known significant effects or critical hazards.	
		XL10-Gold	Causes serious eye damage.	
		2-Mercaptoethanol	No known significant effects or critical hazards.	
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	

Symptoms related to the physical, chemical and toxicological characteristics

SECTION 11: Toxicological information

Inhalation	:	QuikSolution	No specific data.	
		QuikChange Lightning Enzyme	No specific data.	
		10× QuikChange Lightning Buffer	No specific data.	
		QuikChange XL dNTP Mix	No specific data.	
		Dpn I Enzyme	No specific data.	
		pWS4.5 Control Template	No specific data.	
		Control Primer 1 (34-mer)	No specific data.	
		Control Primer 2 (34-mer)	No specific data.	
		XL10-Gold Ultracompetent cells	No specific data.	
		XL10-Gold 2-Mercaptoethanol	No specific data.	
		pUC 18 DNA Control Plasmid	No specific data.	
	Ingestion	:	QuikSolution	No specific data.
			QuikChange Lightning Enzyme	No specific data.
			10× QuikChange Lightning Buffer	No specific data.
			QuikChange XL dNTP Mix	No specific data.
			Dpn I Enzyme	No specific data.
			pWS4.5 Control Template	No specific data.
			Control Primer 1 (34-mer)	No specific data.
			Control Primer 2 (34-mer)	No specific data.
		XL10-Gold Ultracompetent cells	No specific data.	
		XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following:	
			stomach pains	
		pUC 18 DNA Control Plasmid	No specific data.	
Skin contact		:	QuikSolution	No specific data.
			QuikChange Lightning Enzyme	No specific data.
			10× QuikChange Lightning Buffer	No specific data.
			QuikChange XL dNTP Mix	No specific data.
			Dpn I Enzyme	No specific data.
			pWS4.5 Control Template	No specific data.
			Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.	
		XL10-Gold Ultracompetent cells	No specific data.	
		XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following:	
			pain or irritation	
			redness	
			blistering may occur	
		pUC 18 DNA Control Plasmid	No specific data.	

SECTION 11: Toxicological information

Eye contact	: QuikSolution	No specific data.
	QuikChange Lightning Enzyme	No specific data.
	10× QuikChange Lightning Buffer	No specific data.
	QuikChange XL dNTP Mix	No specific data.
	Dpn I Enzyme	No specific data.
	pWS4.5 Control Template	No specific data.
	Control Primer 1 (34-mer)	No specific data.
	Control Primer 2 (34-mer)	No specific data.
	XL10-Gold Ultracompetent cells	No specific data.
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain watering redness
	pUC 18 DNA Control Plasmid	No specific data.

Delayed and immediate effects as well as 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

General	: QuikSolution	No known significant effects or critical hazards.
	QuikChange Lightning Enzyme	No known significant effects or critical hazards.
	10× QuikChange Lightning Buffer	No known significant effects or critical hazards.
	QuikChange XL dNTP Mix	No known significant effects or critical hazards.
	Dpn I Enzyme	No known significant effects or critical hazards.
	pWS4.5 Control Template	No known significant effects or critical hazards.
	Control Primer 1 (34-mer)	No known significant effects or critical hazards.
	Control Primer 2 (34-mer)	No known significant effects or critical hazards.
	XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
	XL10-Gold 2-Mercaptoethanol	Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.

SECTION 11: Toxicological information

Carcinogenicity	:	QuikSolution	No known significant effects or critical hazards.
		QuikChange Lightning Enzyme	No known significant effects or critical hazards.
		10× QuikChange Lightning Buffer	No known significant effects or critical hazards.
		QuikChange XL dNTP Mix	No known significant effects or critical hazards.
		Dpn I Enzyme	No known significant effects or critical hazards.
		pWS4.5 Control Template	No known significant effects or critical hazards.
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.
		XL10-Gold	No known significant effects or critical hazards.
		Ultracompetent cells	No known significant effects or critical hazards.
		XL10-Gold	No known significant effects or critical hazards.
		2-Mercaptoethanol	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
	Mutagenicity	:	QuikSolution
		QuikChange Lightning Enzyme	No known significant effects or critical hazards.
		10× QuikChange Lightning Buffer	No known significant effects or critical hazards.
		QuikChange XL dNTP Mix	No known significant effects or critical hazards.
		Dpn I Enzyme	No known significant effects or critical hazards.
		pWS4.5 Control Template	No known significant effects or critical hazards.
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.
		XL10-Gold	No known significant effects or critical hazards.
		Ultracompetent cells	No known significant effects or critical hazards.
		XL10-Gold	No known significant effects or critical hazards.
		2-Mercaptoethanol	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Teratogenicity		:	QuikSolution
		QuikChange Lightning Enzyme	No known significant effects or critical hazards.
		10× QuikChange Lightning Buffer	No known significant effects or critical hazards.
		QuikChange XL dNTP Mix	No known significant effects or critical hazards.
		Dpn I Enzyme	No known significant effects or critical hazards.
		pWS4.5 Control Template	No known significant effects or critical hazards.
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.
		XL10-Gold	No known significant effects or critical hazards.
		Ultracompetent cells	No known significant effects or critical hazards.
		XL10-Gold	No known significant effects or critical hazards.
		2-Mercaptoethanol	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.

SECTION 11: Toxicological information

Developmental effects	: QuikSolution	No known significant effects or critical hazards.	
	QuikChange Lightning Enzyme	No known significant effects or critical hazards.	
	10× QuikChange Lightning Buffer	No known significant effects or critical hazards.	
	QuikChange XL dNTP Mix	No known significant effects or critical hazards.	
	Dpn I Enzyme	No known significant effects or critical hazards.	
	pWS4.5 Control Template	No known significant effects or critical hazards.	
	Control Primer 1 (34-mer)	No known significant effects or critical hazards.	
	Control Primer 2 (34-mer)	No known significant effects or critical hazards.	
	XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.	
	XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.	
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	
	Fertility effects	: QuikSolution	No known significant effects or critical hazards.
		QuikChange Lightning Enzyme	No known significant effects or critical hazards.
		10× QuikChange Lightning Buffer	No known significant effects or critical hazards.
QuikChange XL dNTP Mix		No known significant effects or critical hazards.	
Dpn I Enzyme		No known significant effects or critical hazards.	
pWS4.5 Control Template		No known significant effects or critical hazards.	
Control Primer 1 (34-mer)		No known significant effects or critical hazards.	
Control Primer 2 (34-mer)		No known significant effects or critical hazards.	
XL10-Gold Ultracompetent cells		No known significant effects or critical hazards.	
XL10-Gold 2-Mercaptoethanol		No known significant effects or critical hazards.	
pUC 18 DNA Control Plasmid		No known significant effects or critical hazards.	

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
QuikSolution Dimethyl sulfoxide	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
Dpn I Enzyme Sodium chloride	Acute EC50 2430000 µg/l Fresh water	Algae - Navicula seminulum	96 hours
	Acute EC50 519.6 mg/l Fresh water	Crustaceans - Cypris subglobosa	48 hours
	Acute IC50 6.87 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Acute LC50 1661 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 1000000 µg/l Fresh water	Fish - Morone saxatilis - Larvae	96 hours
	Chronic LC10 781 mg/l Fresh water	Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)	3 weeks
	Chronic NOEC 6 g/L Fresh water Chronic NOEC 0.314 g/L Fresh water	Aquatic plants - Lemna minor Daphnia - Daphnia pulex	96 hours 21 days

SECTION 12: Ecological information

XL10-Gold 2-Mercaptoethanol Sodium chloride	Chronic NOEC 100 mg/l Fresh water	Fish - Gambusia holbrooki - Adult	8 weeks
	Acute EC50 2430000 µg/l Fresh water	Algae - Navicula seminulum	96 hours
	Acute EC50 519.6 mg/l Fresh water	Crustaceans - Cypris subglobosa	48 hours
	Acute IC50 6.87 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Acute LC50 1661 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
Acute LC50 1000000 µg/l Fresh water	Fish - Morone saxatilis - Larvae	96 hours	
Chronic LC10 781 mg/l Fresh water	Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)	3 weeks	
Chronic NOEC 6 g/L Fresh water	Aquatic plants - Lemna minor	96 hours	
Chronic NOEC 0.314 g/L Fresh water	Daphnia - Daphnia pulex	21 days	
Chronic NOEC 100 mg/l Fresh water	Fish - Gambusia holbrooki - Adult	8 weeks	

12.2 Persistence and degradability

Not available.

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
QuikSolution Dimethyl sulfoxide	-2.029	3.16	low
10× QuikChange Lightning Buffer Dodecyldimethyl (3-sulphonatopropyl) ammonium	2.24	-	low
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	-0.056	-	low

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

PBT : Not applicable.

vPvB : Not applicable.

12.6 Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

SECTION 13: Disposal considerations

- Methods of disposal** : The generation of waste should be avoided or minimised 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.
- Hazardous waste** : The classification of the product may meet the criteria for a hazardous waste.
- Packaging**
- Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.
- Special precautions** : 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 spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

Regulatory information

ADR/RID / IMDG / IATA : Not regulated.

14.6 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.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code : Not available.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	QuikSolution	Not applicable.
	QuikChange Lightning	Not applicable.
	Enzyme	
	10× QuikChange Lightning	Not applicable.
	Buffer	
	QuikChange XL dNTP Mix	Not applicable.
	Dpn I Enzyme	Not applicable.
	pWS4.5 Control Template	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	XL10-Gold Ultracompetent cells	Not applicable.
	XL10-Gold	Not applicable.
	2-Mercaptoethanol	
pUC 18 DNA Control Plasmid	Not applicable.	

Other EU regulations

Europe inventory : Not determined.

Industrial emissions (integrated pollution prevention and control) - Air : Listed

SECTION 15: Regulatory information**Ozone depleting substances (1005/2009/EU)**

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

International regulations**Chemical Weapon Convention List Schedules I, II & III Chemicals**

Not listed.

Montreal Protocol (Annexes A, B, C, E)

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.

International lists**National inventory**

Australia	: Not determined.
Canada	: Not determined.
China	: Not determined.
Japan	: Japan inventory (ENCS): Not determined. Japan inventory (ISHL): Not determined.
Malaysia	: Not determined.
New Zealand	: Not determined.
Philippines	: Not determined.
Republic of Korea	: Not determined.
Taiwan	: All components are listed or exempted.
Turkey	: Not determined.
United States	: Not determined.

15.2 Chemical safety assessment : This product contains substances for which Chemical Safety Assessments might still be required.

SECTION 16: Other information

✔ Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

SECTION 16: Other information

Classification	Justification
XL10-Gold 2-Mercaptoethanol Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 3, H412	Calculation method Calculation method Calculation method

Full text of abbreviated H statements

10× QuikChange Lightning Buffer H302 H312 H315 H319 H332 H335 Dpn I Enzyme H319 XL10-Gold 2-Mercaptoethanol H301 H310 H315 H317 H318 H319 H330 H335 H411 H412	Harmful if swallowed. Harmful in contact with skin. Causes skin irritation. Causes serious eye irritation. Harmful if inhaled. May cause respiratory irritation. Causes serious eye irritation. Toxic if swallowed. Fatal in contact with skin. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye damage. Causes serious eye irritation. Fatal if inhaled. May cause respiratory irritation. Toxic to aquatic life with long lasting effects. Harmful to aquatic life with long lasting effects.
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Full text of classifications [CLP/GHS]

10× QuikChange Lightning Buffer Acute Tox. 4, H302 Acute Tox. 4, H312 Acute Tox. 4, H332 Eye Irrit. 2, H319 Skin Irrit. 2, H315 STOT SE 3, H335 Dpn I Enzyme Eye Irrit. 2, H319 XL10-Gold 2-Mercaptoethanol Acute Tox. 2, H310 Acute Tox. 2, H330 Acute Tox. 3, H301 Aquatic Chronic 2, H411 Aquatic Chronic 3, H412 Eye Dam. 1, H318 Eye Irrit. 2, H319 Skin Irrit. 2, H315 Skin Sens. 1, H317 STOT SE 3, H335	ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (dermal) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2 SKIN CORROSION/IRRITATION - Category 2 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2 ACUTE TOXICITY (dermal) - Category 2 ACUTE TOXICITY (inhalation) - Category 2 ACUTE TOXICITY (oral) - Category 3 LONG-TERM AQUATIC HAZARD - Category 2 LONG-TERM AQUATIC HAZARD - Category 3 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2 SKIN CORROSION/IRRITATION - Category 2 SKIN SENSITISATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3
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Date of issue/ Date of revision : 17/10/2016

Date of previous issue : No previous validation.

Version : 1

[Notice to reader](#)

SECTION 16: Other information

Disclaimer: The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.