**Surface Water Source and Abstraction**

**Negative Impact/s:**

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| --- | --- | --- | --- |
| Bacterial Contamination | Chemical Contamination | Aesthetic (Taste/Colour which prevents consumption) | Lack of Water Availability |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Event / Cause** | | | | **Risk Factor/s** | **Current Control Measure/s** | **Risk** | **Improvement/s** |
| Bacteria enters water supply | | | | Toilets upstream/within 30m  Human houses upstream  Animal access to source  Farming activities nearby  Source inlet area is dirty/polluted  Bathing/Laundry performed at source  *Other (Please list)* | Fencing around source  Appropriate screening and filter on source infrastructure  Household water treatment and storage (HWTS)  *Other (Please list)* | *High*  **(Action Needed Now)**  *Medium*  (Upgrades Needed)  *Low*  (No Action Required) | Move toilet/s  Move source inlet  Install screen and filtration  Clean source area  Build fence around source  Prevent human activities at source  *Other (Please list)* |
|  |  |  |  |
| Chemicals enter water supply | | | | Use of pesticides in area  Waste water discharge in area  Algae present at source  Mining in area  Naturally occurring high levels  *Other (Please list)* | Appropriate water treatment  Waste water discharges are managed  *Other (Please list)* | *High*  *Medium*  *Low* | Move source  Remove chemical source/s  Install treatment  *Other (Please list)* |
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| --- | --- | --- | --- | --- | --- | --- | --- |
| Dirt/Debris in water supply  Landslide  Subsidence | | | | Soil erosion at source  Intake located at bottom of slope or gully  Unconsolidated soil on surrounding slopes  Deforestation in area  Surface run-off into source  *Other (Please list)* | Filter at source outlet  Storage/settlement tanks  Terraces for soil on gradient  Vegetation on gradient  Runoff diverted  Gully rehabilitation  Protective structure around inlet/ concrete abstraction structure  *Other (Please list)* | *High*  *Medium*  *Low* | Move source  Install filter  Install storage/settlement  Upgrade abstraction to concrete structure  Build protective structure  Manage soil on slopes  *Other (Please list)* |
|  |  |  |  |
| Uncontrolled supply  Drought | | | | Variation in source water level/s  Leaks in abstraction structure  *Other (Please list)* | Minimum head device (Dam)  Overflow installed  *Other (Please list)* | *High*  *Medium*  *Low* | Install dam  Install overflow  Repair structure  *Other (Please list)* |
|  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Flooding of intake area (fresh water)  Damage from flooding | | | | Located in flood area  Located at bottom of slope or inside river bend  Low permeability soil in surrounding area  Deforestation in area  *Other (Please list)* | Surrounding vegetation  Concrete structure  Overflow/Drainage  Runoff water diverted  Inlet located at side of river  HWTS prepared  *Other (Please list)* | *High*  *Medium*  *Low* | Move source  Upgrade structure (concrete)  Install overflow/drainage  Dig diversion trench/es  *Other (Please list)* |
|  |  |  |  |
| Storm damage to intake structure | | | | Exposed location  Debris loose in area  *Other (Please list)* | Protection from forest/ other structure  Concrete structure  *Other (Please list)* | *High*  *Medium*  *Low* | Upgrade structure (concrete)  Install protective structure/s  *Other (Please list)* |
|  |  |  |  |
| Tsunami/ King Tide | | | | Located near shoreline  *Other (Please list)* | Concrete structure  Mangrove protection  Coral reef protection  *Other (Please list)* | *High*  *Medium*  *Low* | Move source  Upgrade structure (concrete)  *Other (Please list)* |
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| --- | --- | --- | --- | --- | --- | --- | --- |
| Earthquake | | | | Located in earthquake area  *Other (Please list)* | Suitable Materials (e.g. Ferro cement)  *Other (Please list)* | *High*  *Medium*  *Low* | Upgrade structure  Move source  *Other (Please list)* |
|  |  |  |  |
| *(Circle below as appropriate)* | | | |  |  | *High*  *Medium*  *Low* |  |
|  |  |  |  |
| *(Circle below as appropriate)* | | | |  |  | *High*  *Medium*  *Low* |  |
|  |  |  |  |
| *(Circle below as appropriate)* | | | |  |  | *High*  *Medium*  *Low* |  |
|  |  |  |  |

**Spring Water Source**

**Negative Impact/s:**

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| --- | --- | --- | --- |
| Bacterial Contamination | Chemical Contamination | Aesthetic (Taste/Colour which prevents consumption) | Lack of Water Availability |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Event / Cause** | | | | **Risk Factor/s** | **Current Control Measure/s** | **Risk** | **Improvement/s** |
| Bacteria enters water supply | | | | Toilets upstream/within 30m  Animals access to source  Farming activities nearby  Surface water can flow into  source  Silt/soil/dirt near source  **IF SPRING IS COVERED:**  Spring box (including cover, air vent and overflow) is dirty  Silt/soil/dirt inside source  *Other (Please list)* | Clean and well-maintained spring box and cover  Fencing around source  Overflow to drainage area outside fencing  Diversion ditch  Appropriate screen and filter on source outlet  *Other (Please list)* | *High*  **(Action Needed Now)**  *Medium*  (Upgrades Needed)  *Low*  (No Action Required) | Move toilet/s  Build fence  Build spring box (inclusive of cover, meshed air vent and overflow)  Clean spring box and cover  Dig diversion ditch  Install screen and filter on outlet pipe  *Other (Please list)* |
|  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Chemicals enter water supply | | | | Use of pesticides in area  Waste water discharge in area  Algae present at source  Mining in area  Naturally occurring high levels  *Other (Please list)* | Appropriate water treatment  Waste water discharges are managed  *Other (Please list)* | *High*  *Medium*  *Low* | Move source  Remove chemical source/s  Install treatment  *Other (Please list)* |
|  |  |  |  |
| Dirt/Debris in water supply  Landslides  Subsidence | | | | Soil erosion at source  Intake located at bottom of slope or gully  Unconsolidated soil on surrounding slopes  Deforestation in area  Surface run-off into source  *Other (Please list)* | Spring Box covering source  Filter at source outlet  Storage/settlement tanks  Terraces for soil on gradient  Vegetation on gradient  Runoff diverted  Gully rehabilitation  Spring box flush valve  *Other (Please list)* | *High*  *Medium*  *Low* | Move source  Install filter  Install storage/settlement  Build spring box  Build protective structure around spring box  Manage soil on slopes  *Other (Please list)* |
|  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Uncontrolled supply  Drought | | | | Variation in source water level/s  Leaks in spring box structure  *Other (Please list)* | Minimum head device in spring box structure  Overflow installed in spring box  *Other (Please list)* | *High*  *Medium*  *Low* | Install min head device  Install overflow  Repair spring box  *Other (Please list)* |
|  |  |  |  |
| Flooding of intake area (fresh water)  Damage from flooding | | | | Located in flood area  Located at bottom of slope/near river bank  Low permeability soil in surrounding area  Deforestation in area  *Other (Please list)* | Surrounding vegetation  Spring box (concrete and with strong foundation structure)  Overflow/Drainage  Runoff water diverted  Sealed cover  HWTS prepared  *Other (Please list)* | *High*  *Medium*  *Low* | Move source  Build/adapt spring box  Install overflow/drainage  Dig diversion trench/es  Install sealed cover  *Other (Please list)* |
|  |  |  |  |
| Storm damage to spring structure | | | | Exposed location  Debris loose/overhanging  *Other (Please list)* | Protection from forest/ other structure  Concrete spring box  *Other (Please list)* | *High*  *Medium*  *Low* | Upgrade spring box  Install protective structure/s  *Other (Please list)* |
|  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Tsunami/ King Tide | | | | Located near shoreline  *Other (Please list)* | Spring box  Sealed cover  Mangrove protection  Coral reef protection  *Other (Please list)* | *High*  *Medium*  *Low* | Move source  Upgrade spring box  *Other (Please list)* |
|  |  |  |  |
| Earthquake | | | | Located in earthquake area  *Other (Please list)* | Suitable Materials (e.g. Ferro cement)  *Other (Please list)* | *High*  *Medium*  *Low* | Upgrade spring box  Move source  *Other (Please list)* |
|  |  |  |  |
| *(Circle below as appropriate)* | | | |  |  | *High*  *Medium*  *Low* |  |
|  |  |  |  |
| *(Circle below as appropriate)* | | | |  |  | *High*  *Medium*  *Low* |  |
|  |  |  |  |

**Rainwater Collection and Storage**

**Negative Impact/s:**

|  |  |  |  |
| --- | --- | --- | --- |
| Bacterial Contamination | Chemical Contamination | Aesthetic (Taste/Colour which prevents consumption) | Lack of Water Availability |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Event / Cause** | | | | **Risk Factor/s** | **Current Control Measure/s** | **Risk** | **Improvement/s** |
| Bacteria enters water supply  Dirt/Debris enters water supply | | | | Roof is dirty  Gutters are dirty  Tank is dirty  Open access to tank  Tank is cracked  Tap is leaking  Animals can access water collection area  Water collection area is dirty/ standing water  Pollution (e.g. trees, Excreta etc.) near system  Collection bucket dirty  *Other (Please list)* | Tank cover in place  Tank inlet has mesh/sieve  First flush filter  All openings have screens  Collection area is fenced  Overflow pipe leads to drainage point outside collection area  *Other (Please list)* | *High*  **(Action Needed Now)**  *Medium*  (Upgrades Needed)  *Low*  (No Action Required) | No  Clean roof/gutters  Clean tank  Install covers on tank  Install inlet mesh/sieve  Install first flush filter  Repair cracks  Repair/replace tap  Add drainage/clean collection area  Remove pollution from collection area  Build fence around collection area  *Other (Please list)* |
|  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Chemicals enter water supply | | | | Roof is corroded/rust  *Other (Please list)* | Appropriate water treatment  *Other (Please list)* | *High*  *Medium*  *Low* | Install Filter  Repair/replace/paint roof  *Other (Please list)* |
|  |  |  |  |
| Loss of rainwater capture  Drought | | | | Dry periods > 3 months  Holes in roof  Damaged guttering  Damaged piping from gutter to collection tank  *Other (Please list)* | Inclined roofing in good condition  Guttering covers the length of the roof on all available sides  Guttering is closed at both ends  Corrosion resistant roofing and gutter materials (e.g. PVC)  *Other (Please list)* | *High*  *Medium*  *Low* | Replace/repair roof  Replace/repair gutters  Replace/repair downpipe  *Other (Please list)* |
|  |  |  |  |
| Flooding of collection tank (Fresh Water) | | | | Located in flood area  Located at bottom of slope/near river bank  Low permeability soil in surrounding area  Deforestation in area  Open access to tank  *Other (Please list)* | Surrounding vegetation  Sealed tank  Overflow/Drainage  Runoff water diverted  Concrete foundation  Raised above flood level  Tank is anchored to foundation  HWTS prepared  *Other (Please list)* | *High*  *Medium*  *Low* | Move tank  Build/raise foundation  Install overflow/drainage  Dig diversion trench/es  Anchor structure  Seal tank  *Other (Please list)* |
|  |  |  |  |
| Storm Damage | | | | Exposed location  Debris loose/overhanging  *Other (Please list)* | Protection from forest/ other structure  Concrete foundation  Tank anchored  Gutters secured/removable  Roofing secured  *Other (Please list)* | *High*  *Medium*  *Low* | Build/adapt foundation  Anchor tank  Secure gutters  Secure roofing  *Other (Please list)* |
|  |  |  |  |
| Landslide/ Subsidence | | | | Tank located at bottom of slope or gully  Unconsolidated soil on surrounding slopes  Deforestation in area  Tree roots growing near tank foundations  *Other (Please list)* | Concrete foundation  Tank anchored  Terraces for soil on gradient  Vegetation on gradient  Gully rehabilitation  Sealed tank  *Other (Please list)* | *High*  *Medium*  *Low* | Move tank  Build/adapt foundation  Build protective structure around tank  Manage soil on slopes  *Other (Please list)* |
|  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Tsunami/ King Tide | | | | Located near shoreline  *Other (Please list)* | Concrete foundation  Sealed tank  Mangrove protection  Coral reef protection  *Other (Please list)* | *High*  *Medium*  *Low* | Move tank  Build/adapt foundation  Seal tank  *Other (Please list)* |
|  |  |  |  |
| Earthquake | | | | Located in earthquake area  *Other (Please list)* | Concrete foundation  Tank is anchored  Suitable Materials (e.g. Ferro cement)  *Other (Please list)* | *High*  *Medium*  *Low* | Build/adapt foundation  Anchor tank  Move tank  *Other (Please list)* |
|  |  |  |  |
| *(Circle below as appropriate)* | | | |  |  | *High*  *Medium*  *Low* |  |
|  |  |  |  |

**Groundwater Abstraction**

**Negative Impact/s:**

|  |  |  |  |
| --- | --- | --- | --- |
| Bacterial Contamination | Chemical Contamination | Aesthetic (Taste/Colour which prevents consumption) | Lack of Water Availability |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Event / Cause** | | | | **Risk Factor/s** | **Current Control Measure/s** | **Risk** | **Improvement/s** |
| Bacteria enters water supply  Dirt/Debris enters water supply | | | | Toilet within 10m of well  Toilets above well height  Other pollution source/s within 10m of well e.g. rubbish  Standing water within 2m of well  Broken drainage channel  Surface water can enter well  Cracks in concrete wall  Collection bucket dirty  *Other (Please list)* | Fence around well  Well is sealed to 3m depth with lining extended above ground  Drainage channel installed and delivered to area outside of fencing  Well head/apron is concrete and clean  Sanitary seal between well shaft and apron  Open well is covered  *Other (Please list)* | *High*  **(Action Needed Now)**  *Medium*  (Upgrades Needed)  *Low*  (No Action Required) | Move toilets  Build fence around well  Repair/Install concrete  Line well to 3m depth  Repair/upgrade well apron  Clean well area  Remove pollution  Cover well  *Other (Please list)* |
|  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Chemicals enter water supply | | | | Use of pesticides in area  Waste water discharge in area  Mining in area  Naturally occurring high levels  *Other (Please list)* | Appropriate water treatment  Waste water discharges are managed  *Other (Please list)* | *High*  *Medium*  *Low* | Move source  Remove chemical source/s  Install treatment  *Other (Please list)* |
|  |  |  |  |
| Low level of supply/ Drought | | | | Dry periods > 3 months  Low yield well  Sealed lining does not allow water ingress  *Other (Please list)* | Correct well lining  Suitable lifting mechanism  Water levels monitored  Adequate depth  *Other (Please list)* | *High*  *Medium*  *Low* | Replace/repair lining  Start water level monitoring  Extend well depth  Improve lifting mechanism  *Other (Please list)* |
|  |  |  |  |
| Flooding (Fresh Water) | | | | Located in flood area  Located at bottom of slope/near river bank  Low permeability soil in surrounding area  Deforestation in area  Open access to well  *Other (Please list)* | Surrounding vegetation  Sanitary seals on well  Watertight well casing  Adequate drainage  Runoff water diverted  Wellhead raised/ on mound  HWTS prepared  *Other (Please list)* | *High*  *Medium*  *Low* | Move source  Cover open well  Protect/Seal wellhead  Install drainage  Dig diversion trench  Raise height wellhead  *Other (Please list)* |
|  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Storm Damage | | | | Exposed location  Debris loose/overhanging  Open access to well  *Other (Please list)* | Protection from forest/ other structure  Concrete wellhead structure  Secured cover  *Other (Please list)* | *High*  *Medium*  *Low* | Build/adapt wellhead  Secure cover  *Other (Please list)* |
|  |  |  |  |
| Landslide/ Subsidence | | | | Tank located at bottom of slope or gully  Unconsolidated soil on surrounding slopes  Deforestation in area  Tree roots growing near well foundations  Open access to well  *Other (Please list)* | Concrete wellhead structure  Sealed wellhead  Terraces for soil on gradient  Vegetation on gradient  Gully rehabilitation  *Other (Please list)* | *High*  *Medium*  *Low* | Move source  Build/adapt foundation  Build protective structure around tank  Manage soil on slopes  Cover/seal well  *Other (Please list)* |
|  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Tsunami/ King Tide/ Saline intrusion | | | | Located near shoreline  On unmanaged aquifer  Open access to well  *Other (Please list)* | Concrete wellhead  Sealed wellhead  Mangrove protection  Coral reef protection  Deepened well >30m  Managed aquifer recharge  *Other (Please list)* | *High*  *Medium*  *Low* | Move source  Build/adapt wellhead  Cover/seal well  Deepen well  *Other (Please list)* |
|  |  |  |  |
| Earthquake | | | | Located in earthquake area  Open access to well  *Other (Please list)* | Concrete wellhead  Covered well  Suitable Materials (e.g. Ferro cement)  *Other (Please list)* | *High*  *Medium*  *Low* | Build/adapt wellhead  Cover well  Move source  *Other (Please list)* |
|  |  |  |  |
| *(Circle below as appropriate)* | | | |  |  | *High*  *Medium*  *Low* |  |
|  |  |  |  |

**PIPING**

**Negative Impact/s:**

|  |  |  |  |
| --- | --- | --- | --- |
| Bacterial Contamination | Chemical Contamination | Aesthetic (Taste/Colour which prevents consumption) | Lack of Water Availability |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Event / Cause** | | | | **Risk Factor/s** | **Current Control Measure/s** | **Risk** | **Improvement/s** |
| Piping is broken / leak develops  Bacteria into supply  Chemicals into supply | | | | Pollution near piping  Old pipe/corroded  Piping is exposed  More than 50m head loss without breaking pressure  *Other (Please list)* | Pressure rated plastic piping  Piping buried in trench  Isolation joints in intervals  Break pressure points  *Other (Please list)* | *High*  *Medium*  *Low* | Replace/repair piping  Bury exposed piping  Install isolation points  Install break pressure points  *Other (Please list)* |
|  |  |  |  |
| Piping becomes blocked | | | | Water source is unscreened  Piping lengths >1km  Piping goes through multiple gradients  *Other (Please list)* | Water source/ pipe inlet is screened or meshed  Air release valves on piping lengths >1km  Break pressure points  *Other (Please list)* | *High*  *Medium*  *Low* | Install screens/mesh  Install air release valves  Install break pressure points  *Other (Please list)* |
|  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Flooding (Fresh Water) | | | | Located in flood area  Located at bottom of slope/near river bank  Low permeability soil in surrounding area  Deforestation in area  *Other (Please list)* | Surrounding vegetation along pipe track  Piping is buried/anchored  Pressure rated plastic piping in good condition  Runoff water diverted from pipe track  Piping is raised above flood level  *Other (Please list)* | *High*  *Medium*  *Low* | Move/raise piping  Bury/anchor piping  Upgrade pipe material  Install runoff drainage  Dig diversion trench  *Other (Please list)* |
|  |  |  |  |
| Storm Damage | | | | Exposed location  Debris loose/overhanging  Pipe is hanging loosely or openly exposed  *Other (Please list)* | Protection from forest/ other structure  Piping is buried/anchored  Pressure rated piping in good condition  *Other (Please list)* | *High*  *Medium*  *Low* | Move piping  Build protective structure  Bury/Anchor piping  Upgrade pipe material  *Other (Please list)* |
|  |  |  |  |
| Landslide/ Subsidence | | | | Pipe located at bottom of slope or gully  Unconsolidated soil on surrounding slopes  Deforestation in area  Piping is exposed  *Other (Please list)* | Protection from forest/ other structure  Piping is buried/anchored  Pressure rated piping in good condition  Terraces for soil on gradient  Vegetation on gradient  Gully rehabilitation  *Other (Please list)* | *High*  *Medium*  *Low* | Move piping  Build protective structure over pipe  Bury/Anchor piping  Upgrade pipe material  Manage soil on slopes  *Other (Please list)* |
|  |  |  |  |
| Tsunami/ King Tide/ Saline Intrusion | | | | Located near shoreline  Piping is exposed  Leak/s in pipe  *Other (Please list)* | Piping is buried/anchored  Pressure rated piping in good condition  Mangrove protection  Coral reef protection  *Other (Please list)* | *High*  *Medium*  *Low* | Move piping  Bury/Anchor piping  Upgrade pipe material  *Other (Please list)* |
|  |  |  |  |
| Earthquake | | | | Located in earthquake area  Piping is exposed  Old/corroded/non flexible pipe material  *Other (Please list)* | Piping is buried/anchored  Pressure rated piping in good condition  Suitable Materials (e.g. Flexible plastic piping PVC)  *Other (Please list)* | *High*  *Medium*  *Low* | Move piping  Bury/Anchor piping  Upgrade pipe material  *Other (Please list)* |
|  |  |  |  |
| *(Circle below as appropriate)* | | | |  |  | *High*  *Medium*  *Low* |  |
|  |  |  |  |
| *(Circle below as appropriate)* | | | |  |  | *High*  *Medium*  *Low* |  |
|  |  |  |  |

**Water Storage Tank/Reservoir**

**Negative Impact/s:**

|  |  |  |  |
| --- | --- | --- | --- |
| Bacterial Contamination | Chemical Contamination | Aesthetic (Taste/Colour which prevents consumption) | Lack of Water Availability |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Event / Cause** | | | | **Risk Factor/s** | **Current Control Measure/s** | **Risk** | **Improvement/s** |
| Bacteria enters water supply  Dirt/Debris enters water supply  Uncontrolled flow (Low level / High pressure) | | | | Open access to tank  Vents/screens are dirty  Tank is cracked  Pipes are leaking  Dirty inside tank  Standing water around tank  Leaks in surrounding pipes  *Other (Please list)* | Fencing around tank  Tank cover in place  Tank inlet has mesh/sieve  Tank has air vent (meshed)  Overflow pipe (clean) leading to drainage area outside fence  Float valve controlling flow  *Other (Please list)* | *High*  **(Action Needed Now)**  *Medium*  (Upgrades Needed)  *Low*  (No Action Required) | Build Fence  Install covers on tank  Install inlet mesh/sieve  Install air vent  Repair cracks  Repair/replace pipes  Clean tank  Install overflow pipe  Install float valve  *Other (Please list)* |
|  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Flooding (Fresh water) | | | | Located in flood area  Located at bottom of slope/near river bank  Low permeability soil in surrounding area  Deforestation in area  Surface water access to tank  *Other (Please list)* | Surrounding vegetation  Sealed tank  Overflow/Drainage  Runoff water diverted  Concrete foundation  Raised above flood level  Tank is anchored to foundation  HWTS prepared  *Other (Please list)* | *High*  *Medium*  *Low* | Move tank  Build/raise foundation  Install overflow/drainage  Dig diversion trench/es  Anchor structure  Seal tank  *Other (Please list)* |
|  |  |  |  |
| Storm damage | | | | Exposed location  Debris loose/overhanging  *Other (Please list)* | Protection from forest/ other structure  Concrete foundation  Tank anchored  Piping is secured to tank  Covers are secured  *Other (Please list)* | *High*  *Medium*  *Low* | Move tank to protected area  Build/adapt foundation  Anchor tank  Secure piping  Secure covers  *Other (Please list)* |
|  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Landslide/ Subsidence | | | | Tank located at bottom of slope or gully  Unconsolidated soil on surrounding slopes  Deforestation in area  Tree roots growing near tank foundations  *Other (Please list)* | Concrete foundation  Tank anchored  Terraces for soil on gradient  Vegetation on gradient  Gully rehabilitation  Sealed tank  *Other (Please list)* | *High*  *Medium*  *Low* | Move tank  Build/adapt foundation  Build protective structure around tank  Manage soil on slopes  *Other (Please list)* |
|  |  |  |  |
| Tsunami/ Tidal Surge/ Saline Intrusion | | | | Located near shoreline  *Other (Please list)* | Concrete foundation  Sealed tank  Tank anchored  Mangrove protection  Coral reef protection  *Other (Please list)* | *High*  *Medium*  *Low* | Move tank  Build/adapt foundation  Seal tank  Anchor tank  *Other (Please list)* |
|  |  |  |  |
| Earthquake | | | | Located in earthquake area  *Other (Please list)* | Concrete foundation  Tank is anchored  Suitable Materials (e.g. Ferro cement)  *Other (Please list)* | *High*  *Medium*  *Low* | Build/adapt foundation  Anchor tank  Move tank  *Other (Please list)* |
|  |  |  |  |

**Distribution Points/Standpipes**

**Negative Impact/s:**

|  |  |  |  |
| --- | --- | --- | --- |
| Bacterial Contamination | Chemical Contamination | Aesthetic (Taste/Colour which prevents consumption) | Lack of Water Availability |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Event / Cause** | | | | **Risk Factor/s** | **Appropriate Control Measure/s** | **Risk** | **Improvement/s** |
| Bacteria enters water supply | | | | Leaks in surrounding pipes  Animals access to area  Standing water in collection area  Rubbish/pollution near tapstand  Tap stand is cracked  Taps are leaking  *Other (Please list)* | Fence around stand pipe  Drainage channel to area located outside of the fence  Clean concrete apron and tapstand  *Other (Please list)* | *High*  **(Action Needed Now)**  *Medium*  (Upgrades Needed)  *Low*  (No Action Required) | No  Build fence/s  Install drainage  Repair/replace pipe/s  Repair/replace apron and/or tapstand/s  Repair/replace tap/s  Clean collection area/s  *Other (Please list)* |
|  |  |  |  |
| Chemicals enter water supply | | | | Pipes are corroded  *Other (Please list)* | Plastic piping  *Other (Please list)* | *High*  *Medium*  *Low* | No  Replace corroded pipe/s  *Other (Please list)* |
|  |  |  |  |
| Uncontrolled flow (Low level / High pressure) | | | | More than 100m head loss without breaking pressure  Low delivery head <10m  Significant leaks in pipes  *Other (Please list)* | Optimised pipe size for head (calculated)  Pressure rated piping in good condition  *Other (Please list)* | *High*  *Medium*  *Low* | Replace piping  Repair piping  *Other (Please list)* |
|  |  |  |  |
| Flooding (Fresh Water) | | | | Located in flood area  Located at bottom of slope/near river bank  Low permeability soil in surrounding area  Deforestation in area  *Other (Please list)* | Surrounding vegetation  Sealed piping on tapstand  Adequate drainage  Runoff water diverted  Tapstand raised/ on mound  HWTS prepared  *Other (Please list)* | *High*  *Medium*  *Low* | Move tapstand  Protect/Seal tapstand  Install drainage around tapstand  Dig diversion trench  Raise height tapstand  *Other (Please list)* |
|  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Storm Damage | | | | Exposed location  Debris loose/overhanging  *Other (Please list)* | Protection from forest/ other structure  Concrete tapstand and apron  *Other (Please list)* | *High*  *Medium*  *Low* | Build/adapt tapstand  Build protective structure  *Other (Please list)* |
|  |  |  |  |
| Landslide/ Subsidence | | | | Tapstand located at bottom of slope or gully  Unconsolidated soil on surrounding slopes  Deforestation in area  Tree roots growing near tapstand foundations  *Other (Please list)* | Concrete tapstand structure  Sealed piping on tapstand  Terraces for soil on gradient  Vegetation on gradient  Gully rehabilitation  *Other (Please list)* | *High*  *Medium*  *Low* | Move tapstand  Build/adapt tapstand  Build protective structure around tapstand  Manage soil on slopes  *Other (Please list)* |
|  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tsunami/ King Tide | | | | Located near shoreline  *Other (Please list)* | Concrete tapstand  Sealed piping on tapstand  Mangrove protection  Coral reef protection  Raised tapstand  *Other (Please list)* | *High*  *Medium*  *Low* | Move tapstand  Build/adapt tapstand  Raise tapstand  *Other (Please list)* |
|  |  |  |  |
| Earthquake | | | | Located in earthquake area  *Other (Please list)* | Concrete tapstand  Suitable Materials (e.g. Ferro cement)  *Other (Please list)* | *High*  *Medium*  *Low* | Build/adapt tapstand  *Other (Please list)* |
|  |  |  |  |
| *(Circle below as appropriate)* | | | |  |  | *High*  *Medium*  *Low* |  |
|  |  |  |  |

**User/Household**

**Negative Impact/s:**

|  |  |  |  |
| --- | --- | --- | --- |
| Bacterial Contamination | Chemical Contamination | Aesthetic (Taste/Colour which prevents consumption) | Lack of Water Availability |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Event / Cause** | | | | **Risk Factor/s** | **Appropriate Control Measure/s** | **Risk** | **Improvement/s** |
| Bacteria enters water supply  Dirt/Debris enters water supply | | | | Non covered storage  Containers are dirty  Dirty buckets for collection  *Other (Please list)* | Sealed storage containers  HWTS available  *Other (Please list)* | *High*  **(Action Needed Now)**  *Medium*  (Upgrades Needed)  *Low*  (No Action Required) | Obtain sealed storage containers  Clean/disinfect storage Containers & buckets  Begin HWTS  *Other (Please list)* |
|  |  |  |  |
| Low level of supply | | | | Variability in water supply  Main water system regularly unavailable  *Other (Please list)* | Adequate storage volume at household  *Other (Please list)* | *High*  *Medium*  *Low* | Increase storage quantity  *Other (Please list)* |
|  |  |  |  |

**Sanitation**

**Negative Impact/s:**

|  |  |  |  |
| --- | --- | --- | --- |
| Direct Human Contact | Human exposure via environment | People DON’T use the toilet | Vector borne contact |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Event / Cause** | | | | **Risk Factor/s** | **Appropriate Control Measure/s** | **Risk** | **Improvement/s** |
| Human contact with faeces | | | | Broken/dirty riser or pan  Wooden floor  *Other (Please list)* | Concrete/solid floor  Clean riser and pan  Handwashing station  *Other (Please list)* | *High*  **(Action Needed Now)**  *Medium*  (Upgrades Needed)  *Low*  (No Action Required) | Clean/replace riser or pan  Clean floor  Replace floor surface  Install handwashing station  *Other (Please list)* |
|  |  |  |  |
| Surrounding environment is contaminated by faeces/sludge/ waste water | | | | Shallow pits depth  Broken septic tank  High groundwater table  *Other (Please list)* | Collection pit is adequately  lined  Collection pit has adequate  depth  Collection pit has access  cover  Septic tank has drainage  trench/treatment  *Other (Please list)* | *High*  *Medium*  *Low* | Rebuild toilet  Line new toilet pit  Install access cover  Install septic tank drainage  *Other (Please list)* |
|  |  |  |  |
| People don’t use sanitation facilities | | | | Toilet smells  Toilet is hot  Toilet has lots of flies  *Other (Please list)* | Adequate air ventilation  Superstructure provides privacy and security  *Other (Please list)* | *High*  **(Action Needed Now)**  *Medium*  (Upgrades Needed)  *Low*  (No Action Required) | Install adequate ventilation to cool and minimise flies  Improve superstructure  *Other (Please list)* |
|  |  |  |  |
| Flooding (Pits and other waste storage is flooded) | | | | Located in flood area  Located at bottom of slope/near river bank  Low permeability soil in surrounding area  Deforestation in area  *Other (Please list)* | Surrounding vegetation  Sealed piping on toilet  Adequate drainage  Runoff water diverted  Toilet raised/ on mound  HWTS prepared  *Other (Please list)* | *High*  *Medium*  *Low* | Move toilet  Protect/Seal toilet  Install drainage around toilet  Dig diversion trench  Raise height toilet  *Other (Please list)* |
|  |  |  |  |
| Storm Damage (Toilet no longer functioning) | | | | Exposed location  Debris loose/overhanging  *Other (Please list)* | Protection from forest/ other structure  Concrete/steel structure  *Other (Please list)* | *High*  **(Action Needed Now)**  *Medium*  (Upgrades Needed)  *Low*  (No Action Required) | Move toilet  Build reinforced structure  *Other (Please list)* |
|  |  |  |  |
| Landslide/ Subsidence (Toilet no longer functioning) | | | | Toilet located at bottom of slope or gully  Unconsolidated soil on surrounding slopes  Deforestation in area  Tree roots growing near toilet foundations  *Other (Please list)* | Concrete structure  Sealed piping on toilet  Terraces for soil on gradient  Vegetation on gradient  Gully rehabilitation  *Other (Please list)* | *High*  *Medium*  *Low* | Move toilet  Build/adapt toilet  Improve protective structure around toilet  Manage soil on slopes  *Other (Please list)* |
|  |  |  |  |
| Tsunami/ King Tide | | | | Located near shoreline  *Other (Please list)* | Concrete structure  Sealed piping on toilet  Mangrove protection  Coral reef protection  Raised toilet  *Other (Please list)* | *High*  **(Action Needed Now)**  *Medium*  (Upgrades Needed)  *Low*  (No Action Required) | Move toilet  Build/adapt toilet  Raise toilet  *Other (Please list)* |
|  |  |  |  |
| Earthquake | | | | Located in earthquake area  *Other (Please list)* | Concrete structure  Suitable Materials (e.g. Ferro cement)  *Other (Please list)* | *High*  *Medium*  *Low* | Build/adapt toilet  *Other (Please list)* |
|  |  |  |  |