



SOUTH AFRICAN WINE AND SPIRIT BOARD

Scheme for Integrated Production of Wine

**Integrated Production of Wine:
Guidelines for Wineries and Bottling Facilities**

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The inherent quality of grapes determined by the genetic characteristics of the cultivars and the application of the IPW guidelines for the farm can be negated by the wrong harvesting, winemaking and bottling procedures. Successful winemaking and handling requires large capital inputs and high quality manpower. Incorrect application of equipment and chemicals, wasteful use of water and electricity and the dumping of waste products in nature have a negative effect on the environment and on the image of wine. These processes must therefore carry the principles of IPW through to the final product.

The winery and its immediate environment should reflect an image of environmentally friendly and food safe production. Wine production will be evaluated according to the following guidelines to determine if wines qualify as IPW wines. For a wine to qualify for the IPW seal, only grapes and/or bulk wine that qualify for IPW may be used. In addition, the wine should be made and bottled at an IPW certified winery and/or bottling facility and all prescribed records must be kept.

These guidelines are applicable to wineries and bottling facilities. Where “winery” is stated in the text, it also applies to a bottling facility. Also refer to the IPW Manual for scoring of the guidelines (published separately on www.ipw.co.za).

1 IPW TRAINING

To implement IPW successfully and effectively requires thorough knowledge of the principles involved.

- At least one representative of the winery that is in direct control of production or winemaking should be formally appointed and should regularly attend an IPW training course. This representative should be responsible for completing the IPW self-assessment, and be present (or at least available) during IPW third party auditing. External consultants may assist with IPW management through document control and recordkeeping. However, unless it can be confirmed that the consultant has been appointed in a continuous decision making position in the winery and is suitably trained, the consultant but may not represent the supplier or facilitate IPW third party audits on behalf of the winery.
- All course attendants will receive a certificate (valid for three years) to certify that they have attended an accredited IPW course. A refreshment course should be attended every three years thereafter to ensure effective management of IPW in the winery.
- Additional to the certificate, a thorough knowledge of the IPW principles should be demonstrated by the person responsible for IPW in the winery.

2 ZONING, REGISTRATION AND ANALYSIS OF INCOMING WATER

The winery should have a map (or Google image) of the property on file indicating at least the following:

- Winery buildings
- Incoming water lines to the facility
- Dams/boreholes/springs/rivers/wetlands/storm water furrows on the property
- Wastewater lines and treatment system
- Wastewater containment dam(s) (if applicable)
- Area where wastewater is irrigated (if applicable) or disposed of (e.g. Municipal line)
- Relevant sewage systems (e.g. septic tank and soak-aways, conservancy tanks, entry point of Municipal line, composting areas etc.)

The winery should also have the following documentation available:

- Building plans approved by the Municipality and/or a certificate of occupancy issued by the Municipality should be available for a newly constructed packhouse or any expansions done since the previous audit. If applicable, evidence (Record of Decision (RoD) from the Department of Environmental Affairs) should be available to confirm that construction or enlargement of the winery took place according to the relevant environmental legislation.
- A Zoning Certificate to confirm that the land where the winery is situated, is zoned as Agri-Industrial / Industrial land. Where wineries are situated on farms, the applicable land should be rezoned from Agricultural land (Agriculture I) to Agri-Industrial land (Agriculture II). Wineries situated in Industrial areas of towns should also provide a Zoning Certificate as confirmation of the property’s zoning. Zoning certificates are issued by the local Municipality.

- A Certificate of Acceptability for Food Premises (Regulation 638) should be available as indicated in Government Notice No. R. 638 of 22 June 2018.
- Evidence must be provided to confirm that the water used in the winery, is registered at the relevant authority for the applicable use (Agri-Industrial). Boreholes, river abstractions, spring abstractions, etc. must be registered at the Department of Water and Sanitation (DWS).
- The abstraction and storage of water must comply with Section 22 of the National Water Act 1998. Water use may be authorised through an existing lawful use declaration, Schedule 1, General Authorisation or water use license. Where the water use is authorised through a General Authorisation it must comply with the General Authorisation published in Government Notice No 538 of 2 September 2019.
- Should Municipal water be used, evidence should be available in the form of Municipal invoices.
- A recent, complete chemical and microbial analysis of the water used in the winery should be available. Analyses must be conducted at least once every twelve months by an accredited laboratory to determine whether the water quality conforms to the SABS 241-1:2015 drinking water standard.
- The SANS 241-1: 2015 standard can be purchased on the following website <https://store.sabs.co.za/catalog/product/view/id/2135761/s/sans-241-1-2015-ed-2-00-2>

Furthermore, the winery should be able to indicate/demonstrate the method of sewage disposal, e.g. septic tank fitted with a soak-away, conservancy tank emptied by contractor/Municipality or direct disposal into a Municipal sewer. Should an external company be responsible for the removal/disposal of sewage, records should be available as confirmation of its removal and safe and legal disposal. For direct disposal into the Municipal sewer, Municipal invoices should be provided as confirmation of its removal and safe disposal.

3 QUALITY & TEMPERATURE OF INCOMING GRAPES (not applicable to bottling facilities)

Records should be kept of the percentage rot and temperature of each grape load received at the winery.

Rotten or diseased grapes may not be used to make IPW wines, except in the case of *Botrytis* infection for production of Special Late Harvest and/or Noble Late Harvest wines. A higher percentage of rotten grapes received will result in an increased Sulphur dioxide usage and energy consumption to ensure that quality wines would still be produced. Less than 5% rotten grapes are considered good, but more than 20% rotten grapes are rated poor.

During hand and mechanical harvesting, maximum care should be taken not to damage grapes and compromise quality. To preserve quality, grapes should be harvested at the lowest possible temperature and standing time should be reduced to a minimum. In case of mechanical harvesting, the machine should be set to limit damage to grapes and to minimize the loss of juice and inclusion of material other than grapes (MOG). Strict measures to limit oxidation should be implemented when grapes are transported over long distances. During transportation to the winery, grapes may not come into contact with substances that are not registered for use on grapes in an IPW programme (e.g. pesticides), or any other substances that may contaminate grapes (e.g. fertilisers, oils and lubricants). Decks of trailers or trucks should be of food grade material or coated in an acceptable manner. Should all grape loads for winemaking purposes arrive at the winery at temperatures under 25°C, it is evaluated as good. Should the temperature of a grape load exceed 30°C, it is evaluated as poor. If grapes are cooled at the winery before it is processed, the temperature of the incoming grape loads applicable to this guideline should be taken before grapes are cooled.

4 ENERGY USE AND CARBON EMISSIONS

Climate change is probably the most important environmental aspect currently under investigation in the world. As part of their purchasing structure, international markets are placing increasing focus on environmental impact caused by global warming. Global warming and its long-term effect on the agricultural industry will impact each and everyone. It fundamentally results from the emission of green house gases including carbon dioxide (CO₂) and methane into the atmosphere. For reporting purposes, all greenhouse gas emissions are expressed in CO₂ equivalent emissions (CO₂e).

Various winery activities contribute to greenhouse gas emissions/CO₂e of which the largest contribution is from the combustion of fossil fuels which is directly used for transport and indirectly

by using ESKOM for electricity generation. To ensure that wineries continuously decrease their CO_{2e}, various records should be kept to benchmark each winery activity before setting objectives for continual improvement in future.

4.1 Carbon Emissions

The winery (including the farm where applicable and if it is preferred) must keep records of monthly energy usage applicable to winery operations. These records should be summarised in table form to indicate the amount of each energy source used per month for each calendar year or financial year. Summaries should be available for at least two consecutive years for comparison purposes. To calculate carbon emissions and to measure continual improvement of energy usage, the following records are regarded as the most important:

- Electricity usage (kWh)
- Diesel usage (Liters)
- Petrol usage (Liters)
- Liquid Petroleum Gas (LPG) usage (kg)
- Any other fuels (e.g. coal, furnace oil, etc.) (kg or Liters)

This guideline is evaluated based on availability of records and not based on the amount of energy used. Above-mentioned records must also be available at smaller wineries.

Note: Transportation of grapes to the winery:

- The transport of grapes from a farm to a winery is measured as part of the farm's carbon footprint calculation. Even if the winery arranges and pays for grape transport, the carbon footprint is always calculated as part of the the farm's carbon footprint calculation.
- The transport of wine or juice from one winery to another winery will be entered in a separate field in the carbon calculator, i.e. "Distribution after winery gate". Keep in mind that this is not the the calculation for distribution to the market.
- Transport of wine from a winery to a bottling facility should also be entered in the field mentioned above, i.e. "Distribution after winery gate".
- For the transport of wine from wineries or bottling facilities to the market, separate records are kept under "Distribution". Contractors are mostly used for this purpose and it is often out of the direct control of the winery.

To summarise:

- Farms always keep records of the transporting of grapes to wineries.
- Wineries always keep records of transport to other cellars or to bottling facilities.

4.2 Calculation of carbon footprint

Wineries or bottling facilities have to calculate their carbon emissions by using the internationally accepted protocol and calculator that is available from the website www.climatefruitandwine.co.za. To make this calculation possible, record-keeping is essential. The carbon footprint should preferably be calculated for at least two consecutive years for comparison purposes. It can then be established whether the entity's energy consumption has decreased or at least remained constant. Either calendar year or financial years may be used. If an increase in energy consumption was observed, it should be motivated. Since industry norms are not yet available in all cases, every farm and/or winery is only compared with itself. The most effective measurement to determine whether the carbon footprint has improved or not, is to evaluate the intensity of the emissions by calculating the emissions per liter wine produced per annum. By using this method, an increase in production and the associated increase in energy consumption can be taken into account.

An energy management plan must be compiled to ensure that energy is used effectively. It is strongly advised that the plan be reviewed by the CCC team.

The Confronting Climate Change project (www.climatefruitandwine.co.za) was co-funded by the wine industry via Winetech and was developed specifically to establish an agreed methodology to measure a winery's carbon footprint and to develop a South African wine industry benchmark. The Confronting Climate Change carbon footprinting tool has been independently audited by the Carbon Trust, who have recognized the tool as being a reliable and credible resource for measuring the carbon footprint of the products of companies that represent the supply chains of the South African fruit and wine industry. The wine industry role players are therefore encouraged to utilise the tool.

5 IMPLEMENTING AND MAINTAINING INFRASTRUCTURE AND EQUIPMENT

- Equipment must be covered with inert materials or be made of stainless steel or other inert material to prevent contamination of wine and to facilitate easy cleaning (e.g. free from cracks).
- Only food grade lubricants may be used.
- Floors should be free from cracks, allow free draining and should be cleaned regularly.
- Packaging and storage areas should be maintained to avoid rodent or pest access and a pest control program should be in place. Pest control bait stations must be clearly marked. Records should be kept of pest activity and bait placements.
- Toilet facilities with wash basins, soap and hot water (55°C) or hand sanitizer should be available for use by all staff. These facilities should be well ventilated.
- The winery and storage areas must be well ventilated to avoid undesirable conditions (e.g. humidity, heat build-up, etc.)
- Efficient lighting should be available to ensure safe operation of all equipment and to assist with cleaning.
- Thermometers used in tanks may not contain any mercury. Alcohol or digital types are preferred.
- All pipes, transfer lines and hoses must be stored to allow self draining. They must be flushed with potable water prior to use.
- An equipment and infrastructure maintenance schedule must be in place to ensure the integrity of all equipment and calibrations to avoid any food safety risks. Small wineries may use invoices as proof of repairs and services.

6 SO₂ LEVELS (not applicable where only bulk wines are produced)

SO₂ additions before and after fermentation are common practice to ensure that wines are preserved. The total SO₂ levels of packed wines are evaluated according to Appendix 5A. Since SO₂ additions can still be made after bulk wines are delivered and/or blended, the winery and/or bottling facility that take ownership of the final bottled product, will be held responsible for the total SO₂ level of the wine (and not the initial producer of the bulk wine).

7 HANDLING OF FOOD GRADE CHEMICALS

7.1 Substances added to wine

Natural precipitants, filter materials, fining agents and other wine additives should be used that are free from Genetically Modified Organisms (GMO). Certificates to prove that all relevant substances added to the wine are GMO-free, should be available on file. Only compounds listed in *“Liquor Products Act 60 of 1989”* may be used (refer to Table 6, page 49 of the regulations, obtained from the weblink:

http://www.sawis.co.za/winelaw/download/Regulations,_annotated_05_2019.pdf

7.1.1 *Products possibly containing GMO's*

Recent certificates to confirm that all relevant products are GMO free should be available. Also refer to Guideline 7.1.1 in the IPW Manual.

7.1.2 *All other additives*

Only legal additives may be used as indicated in the *“Liquor Products Act 60 of 1989”* (Table 6, page 49). Only settling and fining agents are evaluated in this guideline as the use of these substances may have a negative impact on the environment due to the disposal of used materials causing pollution. Refer to Guideline 7.1.2 and Appendix 5B in the IPW manual.

7.1.3 *Filtration of wine*

Using filter material impacts negatively on the natural environment either due the impact from mining the bentonite or diatomaceous earth, or as a result of the disposal of the used material that contains the filtered organic material that could leach from the filter material and pollute the environment. Also refer to Guideline 7.1.3 and Appendix 5B in the IPW Manual.

7.2 Storage and record-keeping of chemicals

7.2.1 Chemical stores

Wine additives and cleaning chemicals should be stored in separate stores that comply with the same basic requirements set out in the *Guidelines for handling, storage and disposal of agrochemicals in the South African wine industry*. Refer to the following weblink:

<http://www.winetech.co.za/documents/docs2009/handling-agrochemicals.pdf>

Good ventilation, storage on pallets (plastic pallets or wooden pallets covered with a plastic layer) and lockable doors is mandatory.

7.2.2 Traceability

Records as proof of balance between the amount of each product purchased and used should be available (**stock control record**). Records should include the batch number of each product added to each wine batch for traceability purposes. Records should be kept of all additions, including the date, quantity, lot number of the additive, tank and wine batch to ensure traceability. Tank movements should also be recorded to enable accurate traceability. The Certificate of Analysis (COA) of each product received by the winery should be available. Ensure that the Material Safety Data Sheets (MSDS's) of all products used in the winery are also kept on file.

8 COOLING

Cooling is evaluated according to the type of refrigerant (e.g. R22) as well as the coolant (e.g. propylene glycol) used. Cooling systems should not contain substances that are harmful to the atmosphere and environment (refer to Appendix 5C). The maintenance of cooling units are important to ensure that refrigerants do not leak. Refer to GRN No. 37621 of 8 May 2014 (<http://sawic.environment.gov.za/documents/3050.pdf>) for the phase out schedule. From 1 January 2040 no person is allowed to import, place on the market or use HCFC's. A person is prohibited from using HCFC-22 (**R22**) or any refrigerant or refrigerant blend either in pure form or as a component of blended refrigerants, in the construction, assembly or installation of any new refrigeration or air-conditioning or equipment from 1 January 2015. **The use of HCFC's will be completely phased out by 2040.**

9 WASTEWATER MANAGEMENT

Wastewater is defined as all water used and generated in the winery during processes like the cleaning of tanks, winery equipment and floors, as well as winemaking processes (e.g. filtration, ion exchange, etc.), bleeding of cooling tower water and possibly laboratory wastewater.

- **The governing body for water related issues is the Department of Human Settlements, Water and Sanitation (DWS) and the official Catchment Management Agency of the area (e.g. Breede-Gouritz Catchment Management Agency).** DWS was previously known as the Department of Water Affairs (DWA) and before that as the Department of Water Affairs and Forestry (DWAf). **Wastewater should be managed in accordance with the DWS General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) as published in GN No. 665 on 6 September 2013, available on the following web link:**
http://www.gov.za/sites/www.gov.za/files/36820_gon665.pdf

The current General Authorisation, as published in Government Notice No. 665 of 6 September 2013, should have been revised by DWS before 6 September 2018. However, according to Government Notice No. 383 (dated 12 July 2019) the continued application of Sections 21(e), 21(f), 21(g), 21(h) and 21(j) of Government Notice No. 665 of 6 September 2013 is authorised until the new General Authorisation for waste related activities is gazetted.

- **Alternatively, where wineries dispose of wastewater directly into Municipal sewers, a formal agreement (e.g. industrial effluent permit) and proof of Municipal accounts/invoices for industrial wastewater discharges should be provided as evidence to be able to obtain points for Guidelines 9.1 to 9.4.** Where wastewater is stored in tanks for removal by the Municipality, removal records should confirm that winery wastewater or **wastewater** together with sewage has indeed been removed. In this case, the winery should also be able to confirm that all generated wastewater has been removed (i.e. volume of water used should correspond with volume of wastewater removed). **If removal is done by a waste removal company, evidence should be available that all wastewater was collected and legally disposed of at a Municipal wastewater treatment works.**

- Where small wineries dispose less than 1 cubic meter (1 m³ / 1 kL / 1 000 liter) wastewater into a septic tank and soak-away system on any given day in compliance with the DWS General Authorisation, the maximum points may be obtained for Guidelines 9.3 to 9.4, provided that the soak-away system is not situated in any of the water-controlled areas and must be situated above the 1 in 100 year flood line or riparian habitat whichever is the greatest, or alternatively at least 100 meters from a water resource whichever is the greatest or at least further than a 500 m radius from a borehole that is utilised for drinking water or stock watering, at least 500 m radius from the boundary of a wetland and on land that is not, or does not overlie a major aquifer. The winery should also meet the requirements of Guideline 9.1 (preferably daily water meter readings should be recorded) to confirm that the disposed volume is indeed less than 1 m³ per day. Monthly quality monitoring should be done.

All other wineries should score points according to the following guidelines:

9.1 Monitoring wastewater quantity (see Appendix 5D)

- According to the **DWS General Authorisation for wastewater management**, wineries should monitor the volume of wastewater generated on a weekly basis **for irrigation and river disposal, and on a monthly basis for evaporation**, and records should be kept for auditing purposes. **However, it will be expected of all IPW producers to keep weekly records of wastewater volumes.** Where other facilities and/or processes also contribute to the wastewater volume, these volume monitoring records should also be available. It is therefore important to use an effective water meter(s). In most cases it is allowed to install an effective water meter into the incoming line as the volume of water supplied to the winery should be approximately equal to the amount of wastewater that exits the winery. DWS may also require of the winery to additionally monitor the volumes of wastewater that are irrigated.
- It is also important to attempt to separate rain and storm water from wastewater in order to limit the volume of contaminated water.

9.2 Monitoring wastewater quality (see Appendix 5D)

According to the DWS General Authorisation for wastewater management, wastewater quality should be monitored on a monthly basis prior to disposal. Most wineries store and/or pre-treat their wastewater for re-use/irrigation or to reduce extreme variations in composition prior to disposal. The following procedures should be used for taking representative wastewater samples:

- Sample the wastewater on a monthly basis at the point of irrigation/ disposal. DWS usually require that wastewater quality is also monitored on a monthly basis prior to entry into the irrigation dam.
- Instead of a single grab sample, the sample should be composed of equal quantities of at least 5 samples taken regularly throughout the day, e.g. every 1.5 hours.
- Sample at least 1.5 L wastewater in a glass container and store below 4°C, or as suggested by the laboratory doing the analyses. The sample should be analysed within 48 hours after sampling.
- Avoid sampling at times when the inflows are very low, or when rainwater has a diluting effect.
- Keep record of winery activities at the time when sampling takes place, especially when the total volume at the point of collection is dominated by one or two processes only.

The chemical composition of wastewater gives an indication of the potential environmental and/or social impacts when wastewater is irrigated or disposed in the environment. Juice, wine and lees which are sources of organic carbon and inorganic components such as salts, acids, solids **and cleaning chemicals** can also enter the wastewater stream and lead to further contamination. Wastewater should be analysed for the following parameters by a SANAS accredited laboratory (the laboratory should be SANAS accredited for each parameter):

- Electrical conductivity (EC)
- pH
- Sodium adsorption ratio (SAR)
- Chemical oxygen demand (COD)
- Potassium (K)
- Faecal coliforms

Should DWS require analyses of additional parameters, these should also be included in the wastewater analysis.

Note that monthly quality monitoring is also required by the DWS General Authorisation for disposal of less than 1 m³ wastewater per given day into a soak-away system.

9.3 Storing wastewater (see Appendix 5D)

A scientific study or wastewater management plan should be compiled to investigate all relevant aspects involving wastewater, soil and crop (if applicable), climate and environment to ensure a sustainable wastewater end-use as well as compliance with legislation. This study will assist the cellar master/winemaker to ensure the following:

- Wastewater must be separated from storm and rain water.
- Pipelines for conducting wastewater must be able to handle the maximum volume at any time and must be made of quality material to prevent leakages.
- Catchment dams must be able to handle the maximum volume of wastewater at any one time and enough space should be allowed for possible unexpected volumes of wastewater.
- Catchment dams should be large enough to allow sufficient time for the settling of solids and break-down of organic matter before the water is released or used for irrigation.
- Catchment dams should be of adequate size to ensure that all wastewater generated during rainy spells can be contained. Irrigation may not take place during wet spells to minimize the risk of potential pollution of the environment caused by over-irrigation. In case of an evaporation dam system, it should also be taken into consideration that the volume evaporated may be less than the sum of the rainfall and the volume of winery wastewater generated.
- Catchment dams should be situated in such a way that there is no contact with storm and rain water. The entire wastewater system (furrows and dams) should be lined to ensure that all wastewater is contained to minimize the risk of pollution.
- Irrigation systems must be designed in such a way that leakages do not occur. Irrigation should take place by means of moveable overhead irrigation lines to avoid over-irrigation. Note that flood irrigation may be considered a storm water disposal by DWS and is not allowed unless wastewater quality complies with the applicable limit for a river disposal (i.e. Special Limit or General Limit depending of the location of the disposal area).
- Soil samples should be taken from the wastewater irrigated soils on at least an annual basis and compared to a control soil sample to determine whether the wastewater irrigated soils deteriorated due to wastewater irrigation. These samples should be taken and the results interpreted by a professional (i.e. SACNASP accredited) soil scientist.
- Analyses should be done by a SANAS accredited laboratory.

If winery wastewater is legally disposed of into a soak-away system and proof can be supplied that less than 1 m³ is disposed of per given day per title deed, a scientific study would not be compulsory. Note that the soak-away system, wastewater dam or irrigation area may not be situated in any of the DWS water-controlled areas and must be situated at least 50 m above the 1 in 100 year flood line or riparian habitat whichever is the greatest, or alternatively at least 100 meters from a water resource whichever is the greatest, or at least further than a 500 m radius from a borehole that is utilised for drinking water or stock watering, at least 500 m radius from the boundary of a wetland and on land that is not, or does not overlie a major aquifer.

9.4 Disposal of wastewater (see Appendix 5D)

Department of Human Settlements, Water and Sanitation (DWS) General Authorisation:

- Wastewater disposal on any premises is controlled by the Department of Human Settlements, Water and Sanitation (DWS) and must must comply with Section 22 of the National Water Act 1998. Water use may be authorised through an existing lawful use declaration, Schedule 1, General Authorisation or water use license. Where the water use is authorised through a General Authorisation it must comply with all requirements of the General Authorisation as published in Government Notice No 665 of 6 September 2013.
- The General Authorisation that is currently applicable is published in Government Gazette, No. 665 of 6 September 2013, available on the web link https://www.gov.za/sites/default/files/gcis_document/201409/36820gon665.pdf. In most cases, a formal General Authorisation would be issued by DWS or the applicable Catchment Management Agency, but if the winery is not in possession of a formal document, all requirements of the promulgated regulation must still be met. If conditions of the DWS General Authorisation cannot be met, the owner must apply for a license at DWS for the wastewater end-use.

- The end-uses of wastewater are covered in different sections of the DWS General Authorisation for wastewater management. Refer to the web link below:

https://www.gov.za/sites/default/files/gcis_document/201409/36820gon665.pdf):

- Irrigation: Section 21 (e)
 - River disposal: Section 21 (f)
 - Evaporation, disposal into a soak-away system and storage of wastewater: Section 21 (g)
- As untreated wastewater from wineries, among others, does not qualify for disposal into natural water resources, it is strongly recommended that wastewater is treated or irrigated. If any person wishes to irrigate wastewater on any given day, he/she must comply with Section 21 (e) of the DWS General Authorisation, which allows the irrigation of up to 2 000 m³ wastewater per day per title deed (for crop production, including grazing), provided that wastewater quality complies with the legal requirements.

Depending on the volume of wastewater irrigated on any given day per title deed, the following guidelines are prescribed in Section 21 (e) of the DWS General Authorisation (see also Appendix 5G):

Irrigation of ≤ 50 m³ wastewater per given day per title deed:

- The electrical conductivity (EC) should be ≤ 200 mS/m on any day
- The pH must be between 6 and 9
- The sodium adsorption ratio (SAR) must be ≤ 5
- The chemical oxygen demand (COD) must be ≤ 5 000 mg/L
- The Faecal coliform count should be ≤ 100 000 cfu/100 mL

Irrigation of 50 m³ to 500 m³ wastewater per given day per title deed:

- The electrical conductivity (EC) should be ≤ 200 mS/m on any day
- The pH must be between 6 and 9
- The sodium adsorption ratio (SAR) must be ≤ 5
- The chemical oxygen demand (COD) must be ≤ 400 mg/L
- The Faecal coliform count should be ≤ 100 000 cfu/100 mL

Irrigation of 500 m³ to 2 000 m³ wastewater per given day:

- The electrical conductivity (EC) must be ≤ 70 mS/m on incoming water any day up to a maximum of 150 mS/m
- The pH must be between 5.5 and 9.5
- Suspended solids must be ≤ 25 mg/L
- Chloride as free chlorine must be ≤ 0.25m/L
- Fluoride must be ≤ 1 mg/L
- Soap, oil and grease must be ≤ 2.5 mg/L
- The chemical oxygen demand (COD) must be ≤ 75 mg/L
- The Faecal coliform count should be ≤ 1 000 cfu/100 mL
- Ammonium (ionized and unionized) should be ≤ 3 mg/L
- Nitrite / nitrate as nitrogen must be ≤ 15 mg/L
- Orthophosphate as a phosphate should be ≤ 10 mg/L

- For details regarding all other wastewater **end-uses** please refer to the **DWS** General Authorisation, Sections 21(f) and 21(g). Refer to the weblink https://www.gov.za/sites/default/files/gcis_document/201409/36820gon665.pdf
- Wastewater may only be disposed of or irrigated at least 50 m above the 1 in 100 year flood line or riparian habitat whichever is the greatest, or alternatively at least 100 m from a water resource whichever is the greatest, or at least further than a 500 m radius from a borehole that is used for drinking water or stock watering; should irrigate on at least a 500m radius outside the boundary of a wetland; and may not irrigate on land that is, or overlies, a major aquifer (to be indicated by DWS).
- Irrigation may not take place during the rainy season.
- The registered user must measure the quantity of wastewater irrigated on a weekly basis and the wastewater quality on a monthly basis at the point just before irrigation. Written records must be kept for inspection by the responsible authority.
- The area of irrigation must be demarcated on a 1: 50 000 topographic map and details provided of the crops under irrigation, irrigation techniques and details of emergency procedures.

- Water logging or damaging of soil, occurrence of flies and mosquitoes, bad odors, secondary pollution, penetration of any surface resources and unauthorised use of water by members of the public must be prevented at all times.
- Solid particles must be removed from the wastewater as soon as possible after contamination (before irrigation) by implementing effective screens and disposed of efficiently and responsibly.
- Storm and rain water originating from the irrigation area must be collected to prevent contamination of clean water.
- Water for cooling and cleaning of tanks and other apparatus must be recycled, purified and re-used as far as possible.
- Water may only be treated with environmentally friendly chemicals.

Registration of water uses with DWS:

The following water uses should be registered with the Department of Water Affairs (DWS) in terms of the Waste Discharge Registration System (WDCS) in accordance with the DWS General Authorisation (note that this registration does not form part of the application for a General Authorisation (GA) for e.g. the irrigation of wastewater):

A. Wastewater volumes:

- The volume of wastewater water that is irrigated per title deed per year (any volume).
- The volume of waste water evaporated per title deed, if more than 50 m³ of wastewater is disposed of daily.
- The volume of waste water disposed of into a natural water resource (any volume).

Where wastewater is legally disposed into a formal soak-away system (French drain) and it can be confirmed that less than 1 m³ of wastewater is disposed per given day, the winery does not have to register their wastewater use with DWS.

B. Storage of raw and wastewater in terms of the DWS General Authorisation:

- If more than 500 m³ wastewater is stored for **re-use** (as part of production processes) per given day, it must be registered (maximum of 5 000 m³ will be allowed per title deed) in accordance to the DWS General Authorisation.
- If more than 1 000 m³ wastewater is stored for **disposal** (e.g. beneficial irrigation, evaporation or disposal into a natural water resource) on any day (up to a maximum of 10 000 m³/property or 50 000 m³/wastewater dam system) the water user must registered with DWS.
- The wastewater treatment plants and wastewater disposal sites must be located outside a watercourse, on an area at least 50 m above the 100-year flood line or riparian habitat whichever is the greatest, or alternatively at least 100 meters from a water resource whichever is the greatest, or at least further than a 500 m radius from a borehole that is utilised for drinking water or stock watering, at least 500 m radius from the boundary of a wetland and on land that is not, or does not overlie a major aquifer (as indicated by DWS).
- Any dam (including raw water and evaporation dams) that can hold more than 50 000 m³ of water and of which the wall has a vertical height of more than 5 meters is declared as a safety risk dam. Such a dam must obtain a license from DWS, subject to various control measures for the construction and maintenance of such a dam. A raw water storage dam that holds more than 10 000 m³ of water must be registered with DWS.
- If any of the DWS General Authorisation requirements cannot be met (e.g. wastewater quality, wastewater volume, etc.) a license application must be submitted at DWS.

Also refer to Appendices 5E, 5F and 5G. **Please note that legislation is amended on a frequent basis and these Appendices can only be used as a tool and the winery is not exempted from any legal requirements based on these Appendices.**

10 DISINFECTANTS AND CLEANING AGENTS

The winery and bottling facility must maintain a high standard of housekeeping and only environmentally friendly and food-safe cleaning agents should be used. **All cleaning products should be SANS 1828 certified and all disinfectants should be SANS 1853 certified to ensure that the products are suitable for use in a food grade environment.** The products used will be evaluated in terms of Appendix 5H.

11 MANAGEMENT OF SOLID WASTE

11.1 Disposal and recycling

11.1.1 Disposal of solid waste (including household waste and packaging material) (refer to Appendices 5I and 5J)

Packaging material of “dry” stock, excess apparatus and equipment, paint, oils, lubricants and solvents must be recycled or disposed of in an environment friendly way and in accordance to legislative requirements (also refer to Guideline 11.1.3 that follows).

- Waste bins must be used to collect and sort all waste of the winery (e.g. non-recyclable waste, glass, plastic, paper/carton, metal and used light bulbs).
- If solid waste is removed by a service provider, a copy of the applicable transport and disposal permits of the service provider should be obtained. Removal records should be available for auditing purposes.
- If solid waste is removed by the Municipality and/or disposed of at the Municipal waste disposal site, the applicable approval should be obtained from the Municipality for the removal and/or disposal of general waste. The necessary removal records and/or invoices should also be available for audit purposes.
- The amount and types of waste removed from the facility for re-use, recycling and disposal should be recorded and summarised on a monthly basis.
- **For on-site waste disposal, the various end-use options and legal requirements for general waste management should be adhered to in accordance to the National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008).** Refer to Appendix 5J for relevant legal requirements. **Please note that legislation is amended on a frequent basis and Appendix 5J can only be used as a tool and the winery is not exempted from any legal requirements based on Appendix 5J.**
- The aim of the wine producer should be to only participate in practices which are legal and environmentally sound.

11.1.2 Grape waste, lees and filter rests

- Skins, stems, pips and lees must be contained on an impenetrable layer (such as cement, plastic or suitable clay layer) and covered against rain, to prevent organic acids from seeping out and causing pollution of soil and soil water before having broken down sufficiently to serve as compost. In cases where this waste is disposed on compacted clay soil or on a low risk site, proof must be provided (e.g. soil study, orthophotos, etc.) that all leachate will be contained.
- If no storage space is available, it should rather be used as animal feed or alternatively be supplied to an external company which can process it to compost or re-use it.
- This waste, as well as used sedimentation substances (e.g. bentonite, lees) and filtration material (e.g. diatomaceous earth), may only be stored temporarily before removal to prevent bad odours in the adjacent vicinity.
- Used filtration material, bentonite lees and wine lees should be made available for the recovery of alcohol or tartaric acid where possible to prevent soil and water pollution (which occurs when these substances are exposed to the soil too quickly).
- If used filtration material is not sent for recycling, the waste should be taken to a suitable disposal site to be destroyed as soon as possible, to prevent it from becoming a nuisance (e.g. bad odour). It may also be composted if it can be confirmed that pollution will not occur.
- If synthetic tartaric acid is used, a system for the effective disposal thereof must be in place.
- If any of the waste materials are removed by an external company or companies, the necessary documentation should be available during audits as confirmation (e.g. contracts, removal records, letters, etc.). The external companies should dispose/re-use the material in a responsible manner.
- Composting: It is important that cognisance should be taken of your “Duty of Care” towards the environment as stipulated by the National Environmental Management Act (NEMA). This means that, in terms of specifically composting activities, care should be taken to avoid the potential risk of ground and/or surface water contamination. This can be done by ensuring that composting takes place further than 100 m from any water resource on an impenetrable layer (e.g. clay, concrete or plastic), to ensure that the leachate generated from the composting activities cannot contaminate water resources, and is contained and either re-used on the composting site or treated to DWS standards for river disposal. Other nuisance factors related to composting activities such as flies, rodents and odors should be managed so that it does not

cause a health risk or nuisance to the neighboring properties. Department of Environmental Affairs published Draft National Norms and Standards for Organic Waste Composting. Refer to the National Environmental Management: Waste Act, 2008 (Act 59 of 2008), Government Gazette No. 37300, 7 February 2014 (Government Notice No. 68).

11.1.3 Recycling of solid waste

- Waste bins must be used to collect and sort all waste of the winery (e.g. non-recyclable waste, glass, plastic, paper/carton, metal and used light bulbs). Empty cleaning chemical containers should also be kept separate for recycling purposes.
- Empty cleaning chemical containers and other chemical containers should be recycled in an environmentally responsible manner and the applicable records must be available. If empty containers are returned to the supplying company, records of this practice should also be available.
- Where possible, material should be re-used (e.g. bottles, cartons and dividers).
- The recycling company that removes/receives the waste, should confirm per letter that waste material from the relevant winery or bottling facility is received by the recycling company and that it is responsibly handled and recycled. **A letter should be obtained from each company to indicate management of each waste type**, and the applicable waste permit(s) of the company should be available. Records should be kept for each waste type as confirmation that recycling takes place.
- The amount and types of waste removed from the facility for re-use, recycling and disposal should be recorded and summarised on a monthly basis.

11.2 Cleaning of wastewater dams, pipes and other equipment

- Wastewater dams, tanks, pipes and other equipment should be cleaned annually as large volumes of sludge are collected in this way. The winery must develop a formal procedure for cleaning wastewater dams and screens and the procedure should also include where sludge is discarded.
- An attempt should be made to conduct the cleaning operation in the summer months to allow rapid breakdown, thus minimising bad odours.
- Wastewater sludge may only be applied to the soil once the chemical composition thereof has been determined, indicating that it is suitable to be applied to a specific piece of land. If the sludge contains high concentrations of certain elements, it may negatively influence the soil, water sources and plant performance.
- Sludge can also be composted if it can be confirmed that it does not lead to pollution.
- Where sludge is removed by the Municipality, the necessary approval should be obtained from the Municipality and removal records must be available.

12 AMBIENT NOISE

Noise from pumps, compressors, cooling apparatus and vehicles may cause a nuisance or disturbance to neighbours or neighbouring communities. The specific noise limits for different areas, e.g. industrial, urban, suburban or rural, may differ and are also influenced by the time of day when the noise occurs. Noise levels should, therefore, also be determined outside the winery at the point/s where noise can cause problems. For this reason, for example, if the noise level of equipment or vehicles outside the winery exceeds 45 dB, these equipment or vehicles may only be used between 7h00 and 20h00.

13 PACKAGING MATERIAL (not applicable where only bulk wines are produced)

- Material must be constituted and treated in such a way that it is safe for humans and environmentally friendly.
- Material must be inert and food safe.
- Material should preferably be made of recycled material and should also be recyclable or biodegradable.
- A summary should be available to indicate from which materials and where closures, capsules, labels, bottles, cartons and carton dividers are manufactured. The summary should also indicate whether the product has been made of recycled material and if the product is recyclable or biodegradable.

14 BOTTLING (not applicable where only bulk wines are produced)

Procedures to address the following should be in place:

- Bottle breakages on bottling and disgorgement lines must be managed to avoid any contamination and an acceptable bottle breakage clean up procedure should be in place.
- Glass breakages on the bottling and disgorgement lines and in all pallets and cartons should be monitored and recorded during bottling. Effective glass removal practices must be implemented to ensure that no glass can be present in the final product. Air or water blasting is not allowed to clean up breakages during bottling.
- Broken glass should be collected and recycled as far as possible.
- Staff working in bottling and disgorgement areas is not allowed to wear any loose jewellery or accessories. Only clean clothes are allowed. No open footwear is allowed and appropriate protective clothing should be worn.
- Lights in areas where wine can be contaminated should be covered with Perspex.

15 BONUS POINTS

Bonus points may be awarded by the auditor based on environmental responsible initiatives implemented by the winery to reduce its carbon footprint.

NOTE: The auditor is authorised to award bonus points for additional practices followed by the winery or bottling company based on his/her own discretion and the required evidence. No facility, irrespective of size, is however entitled to these bonus points.

Applicable legislation:

Health Act, No. 63 of 1977

Wet op die Bewaring van Landbouhulpbronne, Nr. 43 van 1983

Wet op Drinkprodukte, Nr. 60 van 1989

Wet op Beroepsgesondheid en -veiligheid, Nr. 85 van 1993

National Water Act, No. 36 of 1998 Revision of General Authorisations in terms of Section 39 of the National Water Act, Government Gazette No.36820, 6 September 2013 (Government Notice No. 665)

National Environmental Management Act, 1998 (Act No. 107 of 1998)

National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) Draft National Norms and Standards for Organic Waste Composting, Government Gazette No. 37300, 7 February 2014 (Government Notice No. 68).

National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) National Environmental Management: Waste Act, 2008 (Act 59 of 2008)

Regulations and additional information:

2017 EIA regulations:

https://www.gov.za/sites/default/files/40772_gon327.pdf

https://www.gov.za/sites/default/files/40772_gon325.pdf

https://www.gov.za/sites/default/files/40772_gon324.pdf

R.683 Certificate of Acceptability for Food Premises:

https://www.gov.za/sites/default/files/gcis_document/201806/41730gon638.pdf

DWS General Authorisation for wastewater storage and disposal as published in Government Notice No. 665 on 6 September 2013:

https://www.gov.za/sites/default/files/gcis_document/201409/36820gon665.pdf

The current General Authorisation, as published in Government Notice No. 665 of 6 September 2013, should have been revised by DWS before 6 September 2018. However, according to Government Notice No. 383 (dated 12 July 2019) the continued application of Sections 21(e), 21(f), 21(g), 21(h) and 21(j) of Government Notice No. 665 of 6 September 2013 is authorised

until the new General Authorisation for waste related activities is gazetted:

https://www.gov.za/sites/default/files/gcis_document/201907/42576gen383.pdf

Refer to Government Notice 351 of 8 May 2014 for the phase out schedule of HCFC's as refrigerant: <http://sawic.environment.gov.za/documents/3050.pdf>).

F. IPW EVALUATION AND CERTIFICATION: WINERIES AND BOTTLING FACILITIES

1. REGISTRATION FOR IPW

Contact the IPW office for registration at (021) 889 6555 or complete the online registration form on www.ipw.co.za

2. IPW CERTIFICATE

An IPW Certificate is issued annually, subject to the following provisions:

- 2.1 An on-line self-evaluation form (available on the website www.ipw.co.za) must be completed by the facility by 31st of May each year as prescribed.
- 2.2 The self-evaluation form should be completed in reference with the IPW Manual for Wineries and Bottling facilities (11th Edition, June 2020).
- 2.3 The qualifying score of 60% or more must be attained.
- 2.4 The following criteria must be complied with:
 - Grapes must be produced according to IPW guidelines.
 - No non-permitted residues may be present in the wine.
 - Prescribed record-keeping must be up to date.
 - The winery must have all required written permission/permits/licenses for solid waste and wastewater management.
 - Wine must be produced and bottled at IPW certified facilities.
- 2.5 If any of the criteria stipulated in 2.4 are not complied with, an acceptable action plan describing the steps to be taken to ensure compliance during the following season, must be in place.

NOTE: Completion of Appendix 4

- Each winery or bottling facility must complete Appendix 4 fully, using the IPW Manual (11th Edition, June 2020) published on www.ipw.co.za.
- Wineries that make wine and bottle and/or disgorge wine on their premises (with own or mobile equipment) have to complete all the sections of the guidelines marked "A" (note that point 14 does not apply to wineries that bottle at external / off-site bottling facilities).
- Wineries that use a mobile disgorgement and/or bottling facility must complete point 14 in collaboration with the service provider.
- Wineries that use an external disgorgement facility and/or bottler must complete point 13 in collaboration with the external facility/facilities.
- Wineries that only produce bulk wine (i.e. wine is sold before bottling), only complete items marked with B (Points allocated are displayed below Appendix 4).
- Bottling facilities only complete items marked with C.

3. THIRD PARTY AUDITING

The IPW Scheme is unique and industry specific. The Scheme complies with international wine industry environmental sustainability criteria, including the 'Global Wine Sector Environmental Sustainability Principles' as published by the International Federation of Wine and Spirits (FIVS) and the 'OIV Guidelines for sustainable Viti-viniculture: Production, processing and packaging of products' as published by the International Organisation of Vine and Wine (OIV).

The IPW Scheme falls under the jurisdiction of the South African Wine and Spirit Board (WSB). To ensure compliance to the IPW Scheme, an independent third party auditing body, Enviroscentific, was appointed to conduct annual independent audits on all IPW registered entities.

Further technical information regarding registration as a member of the scheme, the IPW guidelines, manuals, certification and auditing policies are available from the IPW website at www.ipw.co.za or from the IPW office at (021) 889 6555.

Evaluation per item according to guidelines		Score	Good 5	Avg 3-2	Poor 0	Total
1 IPW Training	A, B, C	5				
2 Zoning, registration and analysis of incoming water	A, B, C	5				
3. Quality and temperature of incoming grapes	A, B	5				
4. Energy use & Carbon Emissions						
4.1 Carbon Emissions	[X2] A, B, C	10				
4.2 CO ₂ Calculation	A, B, C	5				
5 Implementing & maintaining Infrastructure & Equipment	[X2] A, B, C	10				
6 SO ₂ -levels (Appendix 5A)	[X2] A	10				
7 Substances added to wine (Appendix 5B)						
7.1.1 Products possibly containing GMO'S	A, B, C	5				
7.1.2 All other additives	A, B, C	5				
7.1.3 Filtration of wine	A, B, C	5				
7.2 Storage and record-keeping of chemicals						
7.2.1 Chemical store	A, B, C	5				
7.2.2 Traceability	A, B, C	5				
8 Cooling (Appendix 5C)	A, B, C	5				
9 Management of waste water (Appendix 5D – 5G)						
9.1 Monitoring wastewater quantity	[X2] A, B, C	10				
9.2 Monitoring wastewater quality	[X2] A, B, C	10				
9.3 Storing wastewater	[X2] A, B, C	10				
9.4 Disposal of wastewater	[X2] A, B, C	10				
10 Disinfectants & cleaning agents (App. 5H)	A, B, C	5				

Appendix continues....

EVALUATION REGARDING TOTAL SO₂-LEVELS (mg/L)			
Wine type	Good	Average	Poor
Natural dry white wine, Rosé, Blanc de Noir and Sparkling wine (< 5g/l residual sugar)	< 110	110 - 140	>140
Natural dry red wine (< 5g/l residual sugar)	<100	100 - 130	>130
Natural white and red wine, Rosé, Blanc de Noir and Sparkling wine (> 5g/l residual sugar)	< 120	120 - 160	>160
Fortified wines	<100	100 - 150	>150
Noble late harvest and wine from naturally dried grapes ("Straw Wine")	<200	200 - 240	>240

EVALUATION OF SUBSTANCES ADDED TO WINE BASED ON NEGATIVE ENVIRONMENTAL IMPACT¹
APPENDIX 5B

Least	Less	Most
Precipitants and fining agents		
Egg albumen	Bentonite (Calcium/Sodium)	
Gelatin	Activated animal/plant charcoal	
Tannin	Polyvinyl-polypyrrolidone (PVPP)	
Pectolytic enzymes ²	Silicasol	
Ideal milk		
Fish collagen (Isinglass)		
Milk		
Rubigum / Arabic gum		
Casein		
Filter materials		
Crossflow filtration	Cellulose	Perlite
Flotation	Diatomaceous earth	
Candle filters		
Filter sheets		

¹ Only substances which are allowed in terms of table 6 of the "Liquor Products Act 60 of 1989" may be used. Refer to http://www.sawis.co.za/winelaw/download/Regulations,_annotated_05_2019.pdf

² GMO-free certificate must be on file

The most common refrigerants and coolants are indicated below:

Good	Average	Poor	
		Legal	Illegal
Ammonia ¹ Propylene-glycol	<u>HFC's:</u> R134a R143 <u>Azeotropic blends:</u> R407C R407F R410A R507	<u>Coolant:</u> Diethylene-glycol ³ <u>HCFC's:</u> R22 ² = Freon 22 R141b R143a <u>Azeotropic blends:</u> R404A R409A R412A R502	<u>CFC's:</u> R11 R12

¹Highly toxic - must remain in a closed system (not harmful to the atmosphere).

²Interim product which will be phased out in time.

³Highly toxic and should not be used near food or drink for human consumption.

Refer to Government Notice 351 of 8 May 2014 (<http://sawic.environment.gov.za/documents/3050.pdf>) for the phase out schedule. From 1 January 2040 no person is allowed to import, place on the market or use HCFC's. A person is prohibited from using HCFC-22 (R22) or any refrigerant or refrigerant blend either in pure form or as a component of blended refrigerants, in the construction, assembly or installation of any new refrigeration or air-conditioning or equipment from 1 January 2015.

NOTE: Other legal refrigerants or coolants that are not indicated in table 5C may also be used. These refrigerants or coolants will then also be evaluated according to their Ozone Depletion Potential (ODP) and Global Warming Potential (GWP).

WASTEWATER MANAGEMENT

APPENDIX 5D

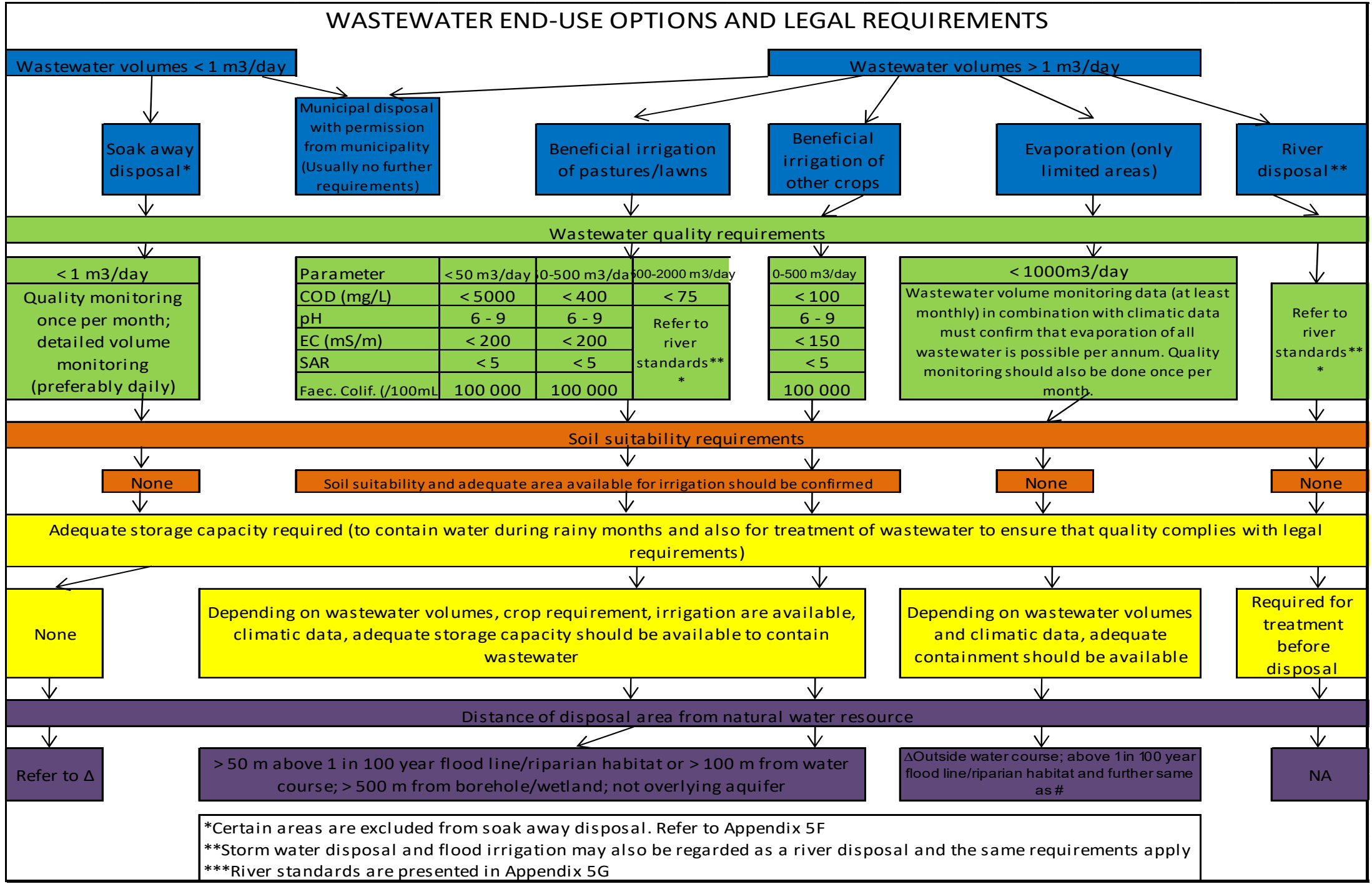
Action	Good (5)	Poor (0)
Monitoring waste water quantity¹	<ul style="list-style-type: none"> - Effective water meter in use. - Weekly with confirming records. 	<ul style="list-style-type: none"> - Poor monitoring or no records.
Monitoring waste water quality²	<ul style="list-style-type: none"> - Monthly determination of COD, EC, pH, SAR, K and Faecal coliforms at a SANAS accredited laboratory with confirming records (official laboratory reports). - Representative sampling just before disposal/irrigation. 	<ul style="list-style-type: none"> - Longer than monthly or no monitoring.
Storing of wastewater³	<ul style="list-style-type: none"> - Scientific proof as confirmation that containment dam is large enough and sealed. - Beneficial irrigation: Soil study as proof of suitability of soil and that irrigation area is large enough. - Beneficial irrigation: Annual soil analyses of areas under wastewater irrigation (as well as control) - Evaporation: scientific study as confirmation that sufficient evaporation will take place without overflow 	<ul style="list-style-type: none"> - If any of the requirements under "Good" are not complied with.
Disposal of wastewater⁴	<ul style="list-style-type: none"> - Formal agreement with Municipality in place for wastewater removal and/or disposal and compliance - Proven compliance with the DWS General Authorisation - Registration of wastewater volumes at the DWS (if applicable) - Registration of wastewater dams with DWS (if applicable) - Formal agreement with neighbour for wastewater disposal (if applicable) 	<ul style="list-style-type: none"> - If any of the requirements under "Good" are not complied with.

¹ Where monitoring occurred, but not on a weekly basis, the auditor could decide to award points for average score (2 or 3).

² Where monitoring occurred, but not on a monthly basis, the auditor could decide to award points for average score (2 or 3). Quality monitoring is not required if wastewater is legally removed by the Municipality or directly disposed (legally) into Municipal sewer, unless required by the Municipality.

³ Where the scientific proof is not available, but according to the auditor highly unlikely that the size of the irrigation area and/or the wastewater containment dam is too small, the auditor could decide to award points for average score (2). A scientific report is not required if wastewater is legally removed by the Municipality or directly disposed (legally) into Municipal sewer, unless required by the Municipality. If the wastewater is removed by the Municipality, the volume of water removed should correspond with the volume of water used in the winery. A scientific report is also not required if less than 1 m³ of wastewater per day is legally disposed into a soak-away system.

⁴ If it can be confirmed that the winery conforms to all legal requirements of the DWS General Authorisation, the auditor may decide to award 5 points. Where an application has not been submitted but a formal agreement and commitment to address wastewater management has been submitted to the Department of Water and Sanitation, 2 points can be awarded. The same is also applicable for the application of authorisation for the direct disposal of wastewater into the Municipal sewer and/or removal of wastewater by the Municipality.



APPENDIX 5F: Subterranean government water control areas excluded from General Authorisation for disposal of waste

Primary drainage region	Tertiary/ Quaternary drainage region	Description of subterranean government water control area	Government Notice No.	Government Gazette Date
H	H30	Baden	136	1967-06-16
A	A30	Bo-Molopo	1324	1963-08-30
C	C30	Bo-Molopo	1993	1965-12-17
D	D41	Bo-Molopo	R634	1966-04-29
A	A24	Crocodile River Valley	208	1981-10-23
A	A21	Crocodile River Valley	18	1983-02-18
A	A21, A22	Kroondal-Marikana	180	1963-06-17
G	G10,G30	Lower Berg River Valley/Saldanha	185	1976-09-10
A,B	A60,B50,B31	Nyl River Valley	56	1971-03-26
G	G30	Strandfontein	2463	1988-12-09
M	M10,M20,M30	Uitenhage	260	1957-08-23
G	G30	Wadrif	992	1990-05-11
G	G20	Yzerfontein	27	1990-02-09
G	G30	Graafwater	1423	1990-06-29
A	A70	Dendron-Vivo	813	1994-04-29
A	A60	Dorpsrivier	312	1990-02-16
C	C24	Ventersdorp	777	1995-06-02

APPENDIX 5G: Legal standards for river disposal and beneficial irrigation of kikuyu

Parameter	River disposal		Beneficial irrigation of kikuyu	Beneficial irrigation of kikuyu (up to 2 000 m ³ /day)
	General limit	Special limit		
Faecal Coliforms (per 100 ml)	1 000	0	100 000	1 000
Chemical Oxygen Demand (mg/l)	75	30	5 000 (if < 50 m ³ /day is irrigated) 400 (if 50 – 500 m ³ /day is irrigated)	75
pH	5.5 – 9.5	5.5 – 7.5	6 – 9	5.5 – 9.5
Ammonia (ionised and un-ionised) as Nitrogen (mg/l)	6	2		3
Nitrate/Nitrite as Nitrogen (mg/l)	15	1.5		15
Chlorine as Free Chlorine (mg/l)	0.25	0		0.25
Suspended Solids (mg/l)	25	10		25
Electrical Conductivity (mS/m)	70 mS/m above intake to a maximum of 150 mS/m	50 mS/m above background receiving water, to a maximum of 100 mS/m	200	70 mS/m above intake to a maximum of 150 mS/m
Ortho-Phosphate as phosphorous (mg/l)	10	1 (median) and 2.5 (maximum)		10
Fluoride (mg/l)	1	1		1
Soap, oil or grease (mg/l)	2.5	0		2.5
Dissolved Arsenic (mg/l)	0.02	0.01		
Dissolved Cadmium (mg/l)	0.005	0.001		
Dissolved Chromium (VI) (mg/l)	0.05	0.02		
Dissolved Copper (mg/l)	0.01	0.002		
Dissolved Cyanide (mg/l)	0.02	0.01		
Dissolved Iron (mg/l)	0.3	0.3		
Dissolved Lead (mg/l)	0.01	0.006		
Dissolved Manganese (mg/l)	0.1	0.1		
Mercury and its compounds (mg/l)	0.005	0.001		
Dissolved Selenium (mg/l)	0.02	0.02		
Dissolved Zinc (mg/l)	0.1	0.04		
Boron (mg/l)	1	0.5		
Sodium adsorption ratio (SAR)			< 5	< 5

EVALUATION OF DISINFECTANTS AND CLEANING AGENTS

APPENDIX 5H

Good	Average	Poor
Anionic and non-ionic		Chlorine dioxide (in gas form)
Iodophores		Sodium hypochlorite
Peroxy-acetic acid		Sodium formulated
Hydrogen peroxide		Chlorinated alkaline products
Acid anionic compounds		Organic acid formulated products (e.g. citric acid)
Calcium- or Potassium hydroxide formulated products		Calcium hypochlorite
Inorganic acid formulated products (e.g. phosphoric and nitric acid)		Potassium hypochlorite
Ozone		
Quaternary ammonium compounds	Quaternary ammonium compounds containing chlorides	

NOTE: Ask the supplier or manufacturer of disinfectants and cleaning agents into which of the above chemical categories the product you obtain from them falls. A particular chemical formulation is often marketed under various brand names. Therefore the Material Safety Data Sheets (MSDS) and Certificates of Analysis/Conformance (COA/COC) indicating the chemical composition must be available for all disinfectants and cleaning agents.

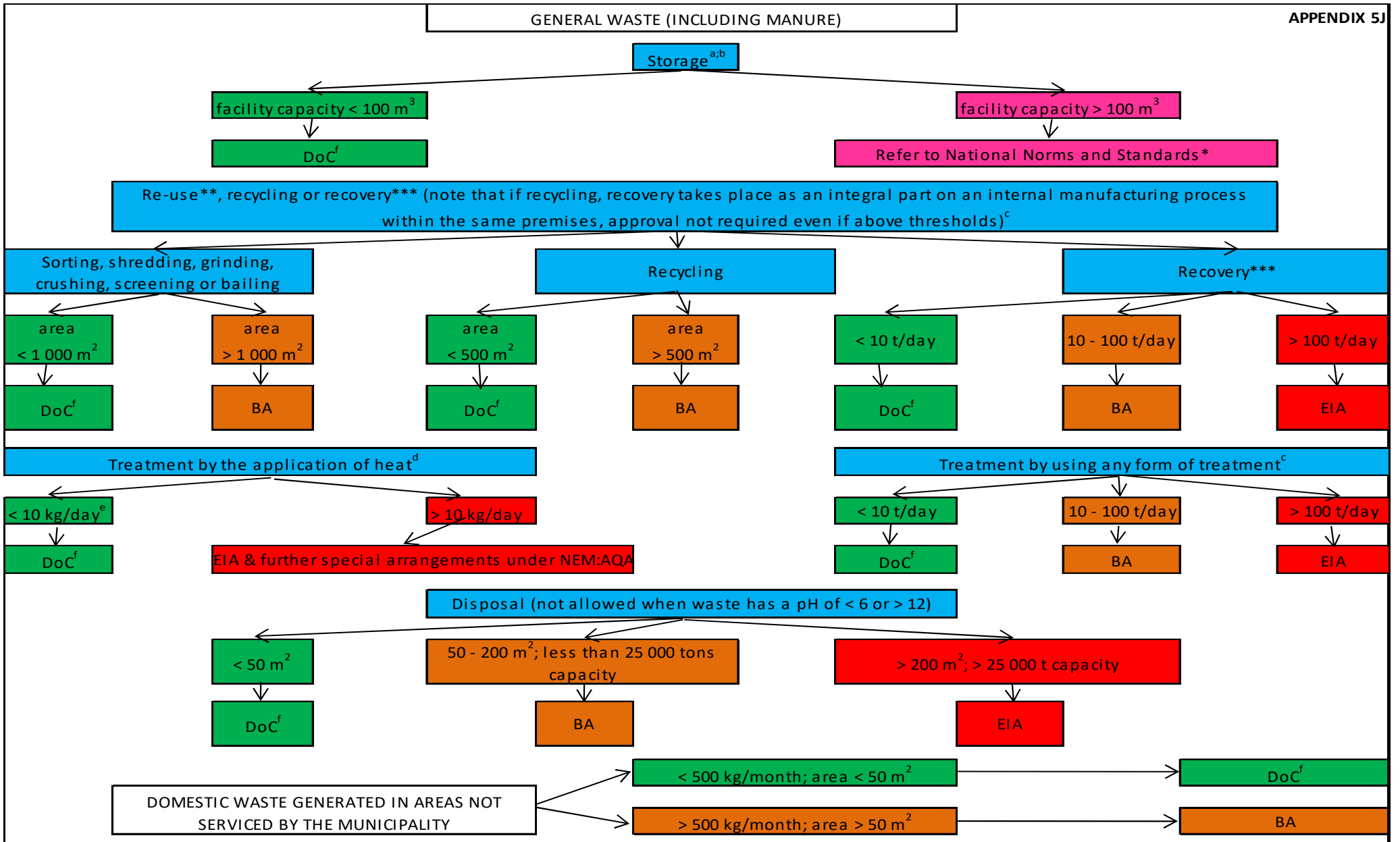
Should sodium hydroxide, chlorine dioxide, sodium hypochlorite, calcium hypochlorite or potassium hypochlorite be used for the treatment of incoming water or wastewater, it will be evaluated under Guideline 9.

SOLID WASTE MANAGEMENT

APPENDIX 5I

Action	Good (5)	Poor (0)
Waste management¹	<ul style="list-style-type: none"> - Removal of general waste by waste removal company. Invoices and a copy of waste disposal permit plus a summary of waste must be available. - Removal of general waste by Municipality (invoices) - Skins, stems, pips and lees diatomaceous earth, bentonite, spent filter material, sludge from catchment dams etc. must be stored on an impenetrable layer (such as cement, plastic or clay) and covered against rain. Proof of compaction/impenetrable characteristics of site is necessary. - Recovery of alcohol or tartaric acid where possible. - Determination of chemical composition before applied to soil. - Waste sorting and implementation of waste recycling programme (letters from recycling company and recycling records, including summary of each waste type) 	- If any of the requirements under "Good" are not complied with, when it was possible.

¹ The auditor can decide to award 3 points if stored in/on a low risk area



Note that waste legislation is amended frequently and this diagram is only a tool and the wine producer is by no means exempted from any legal requirements based on the diagram

DoC = Duty of Care; BA = Basic Assessment; EIA = Environmental Impact Assessment

Note that persons who lawfully conduct waste management activities listed in the relevant Schedule on the date of the coming into effect of the Notice may continue with those activities until such time that the Minister by notice in the Gazette calls upon those persons to apply for waste management licences

^aNN&S - National norms and standards for the storage of waste

^bNational Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) - Government Gazette No. 37083, 29 November 2013 (Government Notice No. 926)

^cNational Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) - Government Gazette No. 37083, 29 November 2013, (Government Notice No. 921)

^dNational Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - Government Gazette No. 37054, 22 November 2013, (Government Notice No. 893)

^eFurther special arrangements also apply: e.g. Installation of monitoring equipment and continuous, on-line measurement of particulate matter (PM), O₂, CO, etc.; Air Quality Improvement Plan

^fEven if a waste licence is not required, NEMA stipulates that each person as a "Duty of care" towards the environment and each person must ensure that the risk of pollution as a result of the activities be minimised and therefore conform to at least the following:

site > 100 m from a water resource and above 1:50 year flood line

site adequately fenced, locked and marked with relevant signs to restrict animals and unauthorised entry

site should not overlie and area with shallow or emergent water tables

waste should not cause any nuisance conditions due to flies or other vermin

site located in previously disturbed areas and not in natural vegetation

*Refer to NN&S for storage of waste

According to the National Environmental Management: Waste Amendment Act, 2014 (Act No. 26 of 2014) - GG No. 37714, 2 June 2014, (Government Notice No. 928):

**Re-use = to utilise the whole, a portion of or a specific part of any substance, material or object from the waste stream for a similar or different purpose without changing the form or properties of such substance, material or object

***Recovery = the controlled extraction of a material/object from waste to produce a product

General waste = waste that does not pose an immediate hazard or threat to health or the environment, and includes: domestic waste; building and demolition waste; business waste; inert waste; or any waste classified as non-hazardous waste in terms of the regulations made under section 69

Business waste = waste that emanates from premises that are used wholly or mainly for commercial, retail, wholesale, entertainment or government administration purpose, which include: Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing

Hazardous waste = any waste that contains organic or inorganic elements or compounds that may have a detrimental impact on health and the environment (includes hazardous waste portion of wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing

According to definition food preparation and processing waste is not hazardous (however, farm waste e.g. obsolete chemicals and empty agro-chemical containers are considered hazardous waste)

According to the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) - Government Gazette No. 36784, 23 August 2013, (Government Notice No. Disposal (not allowed when waste has a pH of < 6 or > 12)

National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) - National Norms and Standards for the storage of waste**Requirements for waste storage facilities**

1- Registered with the competent authority within 90 days prior to construction and provide at least the following:

- a) demarcation of area where facility will be located
- b) name of facility
- c) name of owner of facility
- d) types of waste
- e) size of facility
- f) sources of waste
- g) time frames for storage
- h) coordinates of facility

2 - When choosing site, consider:

- a) public health and environmental protection
- b) requirements in respect of existing servitudes

3 - Training must be provided continuously and programme must include at least the following:

- a) precautionary measures
- b) procedures that must be applied to a particular type of work
- c) procedures for dealing with spillages and accidents
- d) appropriate use of protective clothing
- e) risks of the hazardous substances to employees' health which they are likely to be exposed to

Sufficient number of employees must be trained to cover for leave periods, etc.

An attendance register must be kept and signed by each employee at each training session

Only trained persons must be allowed to handle hazardous waste

4 - Emergency Preparedness Plan must be in place including the following:

- a) hazard identification
- b) prevention measures
- c) emergency planning
- d) emergency response
- e) remedial actions

Immediate action must be taken to contain spillage and prevent it from entering storm water drains or the environment

5 - Monitoring and inspection must be done

- a) containers, tanks, valves, piping containing hazardous waste must be inspected for leaks, etc. on weekly basis
- b) registered engineer must inspect tanks containing hazardous waste at least once per annum
- c) secondary containment system must be examined once weekly or after each significant precipitation event
- d) ventilation systems, sump pumps, emergency alarms, etc. must be inspected weekly
- e) inspection must include review of adequacy and accessibility of spill response equipment
- f) inspection and remedial action must be taken if environmental pollution is suspected

6 - Internal audits

- a) must be conducted bi-annually
- b) official report must be compiled to report findings (submitted to external auditor)

7 - External audits

- a) must be conducted bi-annually by an independent external auditor
- b) official report must be compiled to report findings (submitted to relevant authority)
- c) audit report must - specifically state whether conditions of these standards are adhered to, etc.

8 - Relevant authority audits and inspections

- a) reserves the right to audit and/or inspect without prior notification
- b) all documentation must be available on request

9 - Reporting

- a) an emergency incident must be reported in accordance with section 30 of NEMA
- b) an action plan must be signed off by senior management
- c) complaints register and incident report must be made available to external auditor and relevant authority
- d) external audit reports must be submitted to the relevant authority within 30 days from the date on which the audit was finalised

10 - Records

- a) the following documents must be available: number of waste storage containers; date of collection; authorised collector(s) and proposed final point of treatment/recycling/disposal
- b) any deviations from the approved integrated or industry waste management plan must be recorded
- c) records must be kept for at least 5 years

11 - Minimum requirements during decommissioning phase

- a) site must be rehabilitated to the satisfaction of the relevant authority and according to the rehabilitation plan
- b) rehabilitation plan, including indication of end-use of the area must be submitted to DEA for approval not more than 1 year prior to intended closure
- c) the plan must indicate the measures for rehabilitation of contaminated areas within the facility and the manner in which waste resulted from decommissioning activities will be managed
- d) the owner of the facility, including the subsequent owner of the facility will remain responsible for any adverse impacts on the environment, even after operations have ceased

12 - For additional info regarding a comparison between requirements for General and Hazardous waste storage facilities, refer to Comparison sheet