RMIT UNIVERSITY

Standard Operating Procedure for conducting Qualitative Litter Assessments in inland waterways and wetlands for Melbourne Water

Version 1.0

Technical Report No: 85

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RMIT UNIVERSITY AQUEST

A3P
Aquatic Pollution Prevention Partnership

Melbourne Water

A collaborative research partnership delivering practical management solutions to reduce pollution in our waterways

What's next...

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Acknowledgment of Country

Melbourne Water and RMIT University respectfully acknowledges Aboriginal and Torres Strait Islander peoples as the Traditional Owners and custodians of the land and water on which all Australians rely. This research was conducted on Wadawurrung, Wurundjuri, Woiwurrung and Bunurong Country and we pay our respects to their Elders past, present and future as Traditional Owners and the custodians of the land and water on which we rely and operate.

We acknowledge and respect the continued cultural, social and spiritual connections of all Aboriginal Victorians, and the broader Aboriginal and Torres Strait Islander community have with lands and waters and recognise and value their inherent responsibility to care for and protect them for thousands of generations.

Melbourne Water is committed to working in partnership with Traditional Owners to ensure meaningful ongoing contribution to the future of land and water management.

Report produced by: Aquatic Environmental Stress Research Group under the
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Definitions

Monitoring Site	A site that is regualrly checked quantitatively or qualitatively for predetermined parameters, being litter in the case of this SOP.
Assessment Area	The assessment area is the geographic area that is monitored at each monitoring site. It consists of transect of 30m length and variable width dependant on the lcaotion of the DDL or TOB at individual sites.
Waterline	The line of the shore of the wetland, lake or river to which the waters currently reach
Dominant Debris Line (DDL)	The DDL is where most debris (litter and organic matter) has been deposited on the bank by high flows (figure 5). Multiple debris lines may be present. The dominant debris line will contain the most amount of debris and be the most continuous line along the bank.
Top fo Bank (TOB)	The creek or channel boundary whereby below most normal discharges and channel-forming activities take place. The top of bank boundary will contain the active river channel, active floodplain, and its associated banks.
Flood plain	The area of low-lying ground adjacent to a river, wetland or lake that is subject to flooding during high flows and storm events.
River channel	The natural or artificial watercourse with a definite bed and banks which contains water.
Downstream	The direction in which a creek or river flows or the point closest to the mouth of a river or creek (at the ocean end).
Upstream	The direction which is opposite to the flow in a creek or river. The point furthest away from the mouth of the creek or river or ocean) .
River bed	the bottom of a creek or river or the physical confine of the normal water flow.
River banks	The lateral confines or channel margins are known as the creek banks or riverbanks, during all but flood stage.
Riparian Vegetation	The vegetation growing along the banks of a waterway extending to the edge of the floodplain
Lower Reach Boundary	The lower reach boundary is the most downstream end of the assessment area.
Upper Reach Boundary	The upper reach boundary is the most upstream end of the assessment area.

1. Introduction

The following Standard Operating Procedure (SOPs) describes a qualitative litter monitoring protocol for rapid assessment of site condition in relation to litter along inland waterways and in wetlands. This protocol is based on a review of local, national and international methods for monitoring of litter in inland environments (see Richardson *et al.* 2020) and has been refined as part of MW program litter for amenity program.

1.1. Scope

The qualitative method is based on a visual survey technique that assesses site condition in relation to four parameters, including:

1. The *amount of litter*
2. Whether the litter is *transportable, persistent or buoyant*
3. Whether the litter poses a *biohazard, is toxic or are sharp objects*
4. Whether there is *illegal dumping* at the site.

The qualitative method may be applied to an assessment area that must be defined prior as part of the first step of the protocol. In general, the qualitative method provides a cost-effective approach to evaluate changes in litter condition in receiving waters at numerous assessment areas over time (e.g., evaluating seasonal and yearly changes). Additionally, the qualitative method is best used when attempting to detect large changes in the levels of litter observed over a defined period.

There are two major steps included in this SOP:
Step 1: Defining the boundaries of the **Assessment Area,** which forms the extent of were the protocol is conducted.
Step 2: Conducting a **Qualitative Assessment** of litter levels and site condition

Melbourne Water Crews and Contractors

To aid with data collection, Melbourne Water has leveraged an off-the-shelf survey tool, Esri's Survey123, to standardize the fieldwork data. The primary goal for the use of this digital tool was to eliminate the use of paper and simplify the data collection processes. It also reduces the likelihood of operator error in the field as only predefined values are accepted for entry and data is exported as a csv file which is easily used for data processing. Prior to undertaking field surveys using Survey123 the following steps must be taken:

1. Ensure user access to MW Systems (request via it.support@melbournewater.com.au)
2. Install Microsoft Authenticator app (on a tablet or phone)
3. Ensure user access to Esri Security Group for the ***Litter Condition Rating*** form (request via it.support@melbournewater.com.au)
4. Download Survey123 app (on a tablet or phone)

Allow time to complete Survey123 activation prior to undertaking litter surveys as you will need to be setup in the system. Please see the associated attachment User Guide – Litter Condition Rating Survey123 Form for instructions on downloading and accessing the ***Litter Condition Rating*** form *(*Attachment A).

Community Groups and ad hoc surveys

For ad hoc surveys, a hard copy Data Sheet (See Attachment B) can be completed, and scores tallied manually.

2. Health and Safety

Prior to conducting litter assessments, the field crew should be aware of health and safety issues by reading and acknowledging procedural and site risk assessments. Health and safety issues include, but are not limited to:

- General safety and awareness of surroundings – deep water, steep banks, poisonous plants, blackberry bushes, poisonous animals (snakes, bees, ants).
- Always work in groups of at least two field members.
- Prevention of heat exhaustion and dehydration or hypothermia.
- Any hazardous materials observed should be noted and collected if possible and disposed of appropriately or the EPA and Melbourne Water notified for removal by appropriately trained personal.
- Need to avoid disturbing wildlife, including nesting birds, platypus and water rats.

Recommended PPE and safety equipment when conducting the visual qualitative assessments includes:

- Sun protection (hat, long sleeves, long pants, sunscreen)
- Closed-toed shoes, gumboots
- Gaiters
- Eye protection if working in vegetation
- High visibility clothing
- Snake bandage
- First aid kit

In case an emergency response is needed field crew should be aware of the closest medical facility, and relevant contacts of their organisation for EHS notifications and paperwork. In an emergency call 000 and request the required service, e.g.: fire, ambulance, police.

3. Training and Competency

Visual measurements of Litter Condition can result in poor rating accuracy as they are subjective and depend on the assessor's perception of litter conditions. Consistency in this measurement is found when training is incorporated into the method prior to its performance in the field. Therefore, it is recommended that Maintenance Program Leads and Crew Leads undertaking routine assessments have completed in person training in the qualitative method and using Survey123. The SOP should be read and understood prior to commencing assessments by all persons using the method.

4. Equipment

Equipment required to undertake the qualitative assessments includes:

- 30m tape measure (flexible type e.g. plastic or fibre glass)
- 4 x stakes or high visibility flagging tape
- Data sheets & pens or tablet/phone with Survey123 app access
- GPS (could be on phone)
- Melbourne Water Gate keys (if required for site)

5. Defining an Assessment Area

This section summarizes the process used to delineate the area where qualitative visual assessments will be conducted.

Upon arrival at a designated monitoring site, you need to first determine the location of the 30m section of the river, creek or wetland to be assessed. The assessment area should be a length of the waterway or bank of wetland that represents the poorest litter condition within the reach or wetland being assessed (Figure 1). When first establishing a site the assessment area should be accurately measured and defined. On subsequent visits, assessments should be made in the same location based on area markers described or marked during the initial site visit.

The length of the assessment area is 30 metres. The length is measured not as a straight line but follows 30m of the actual creek or wetland bank perimeter length, including sinuous curves (Figure 1). Where possible, the starting and/or ending points of the assessment area should be easily identified landmarks,

such as a particular tree or large and distinctive rock, and noted on the data sheet, or documented using a global positioning system (GPS), to assist in future assessments being made at the same location.

The assessment area width for sites on creeks, channels and rivers extends from 1m below the waterline to 2 metres beyond the "dominant debris line" or DDL. The DDL is a site-specific physical indicator, a debris line found in the riparian vegetation along the river channel. If the DDL cannot be determined, the width of the assessment area will be documented using the "top of bank" or TOB, noting that the DDL could not be determined. The TOB refers to the creek or channel boundary where most normal discharges and channel-forming activities take place. The top of bank boundary will contain the active river channel, active floodplain, and its associated banks. For wetland sites, instead of the DDL or TOB, the assessment area width is delineated based on a change in substrate material, presence of a line of upland vegetation, or onset of development to 1 m below the waterline.

Figures showing how to delineate an assessment area for creeks/channels/rivers, and wetland locations are included in Attachment C.

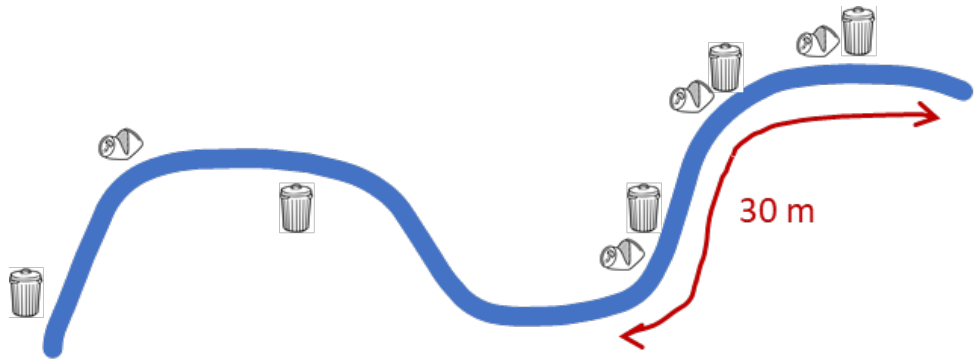


Figure 1: Schematic of 30m assessment area showing highest litter accumulation for condition assessment

Defining the assessment area:

1. Establish or confirm a 30m sampling reach on one side of the waterbody which represents the area of highest visible litter accumulation at the site. Identify the downstream starting point and mark with a stake or flagging tape (Lower Reach Boundary). If using hard copy data sheets, record the GPS location and any easily identified landmarks on the data sheet.

Note: If you are completing the survey using Survey123 the date and time of the survey will be auto populated, and the GPS location recorded when you submit the form. Therefore, **it is important to submit the completed survey while standing at the upper boundary end of the 30m assessment area**.

2. Place the tape measure onto the ground at the Lower Reach Boundary and measure 30m along the water's edge to identify the upstream ending point (Upper Reach Boundary). Mark the 30m Upper Reach Boundary with a stake or flagging tape. If using hard copy data sheets record the GPS co-ordinates and any easily identifiable landmarks.

3. Confirm, document and mark with flagging tape the DDL. Litter below this line should be expected to move into the riverbed or downstream during the next overflow event. If you cannot determine the DDL, identify the top of bank and place a mark here. If you are using a hard copy data sheet, measure and record the width of the assessment area to the DDL at the upper and lower reach boundaries and in the middle.

4. Mark the point 2m beyond the DDL or top of bank. This should give you a rectangle which forms your assessment area, which includes the whole area from 2 m beyond the DDL down to 1 m into the waterbody. If possible, for sites with ongoing monitoring field crews could mark the boundary of the assessment area during the initial monitoring event to facilitate future assessments. If this is

not possible document as best as possible landmarks that can be used to assist in identifying the assessment area as well as GPS co-ordinates of assessment area start and end points.

6. Conducting the Assessment

This section outlines the procedures for completing the site information and undertaking a qualitative assessment. This process will differ depending on whether you are using hard copy data sheets or Survey123.

6.1. General Site Information – *hard copy data sheet only*

Conditions at a given site can contribute to the amounts and distribution of litter found in the general area. These conditions can change over time and for sites assessed regularly this information can also provide insight into any changes affecting litter at the site. This section describes procedures for completing the Litter Assessment Area and General Site Information on the hard copy Data Sheet (See Attachment B).

6.1.1. Assessment Area Information – *hard copy data sheet only*

On the data sheet complete all information associated with the location and boundaries of the assessment area. This includes the receiving water body name, surveyor names and contact details, site name and code, length and widths of the assessment area, GPS coordinates for the upper and lower boundary of the area, date, start and finish times.

6.1.2. Site Conditions – *hard copy data sheet only*

On the data sheet complete all the information relating to the site conditions using the pre-defined options. If you have further comments enter these into the comments section of the form. This includes documenting information about any evidence of current or recent flooding or high flows at the site. This could be observed as water flooding over the banks or a debris line where litter shows the level the water has been recently due to flooding. Next record whether there is evidence of illegal dumping outside the assessment area. Select the type of illegal dumping observed and provide any further comments of that might assist in organising litter removal. Record any observations of recent activities such as mowing, a public event, clean-up or litter removal activities, high winds, storm or flood occurring around or within the survey area using the list of options provided. Lastly, record your observation on the general cleanliness of the site upon first impression using the options provided.

6.1.3 General Site and Assessment Area Information – *Survey123 only*

In Survey123, details of the Inspection date and time and inspector details will be auto populated and are read only once you open the form. Crews will need to provide details regarding whether the works are part of a litter works order or following a complaint. You will need to enter the work order number with “WO” at the start for example: WO08052119, before proceeding to the qualitative assessment questions.

After completing the qualitative assessment questions, crews will need to answer several questions regarding the overall condition of the works area (this includes outside of the 30m assessment area). Specifically, you will need to enter a response regarding the proportion of litter at the site that could not be removed due to inaccessibility and whether there is any illegally dumped and/or large objects found within the works area.

Crews need to take a photo of the 30 m section of the waterway reach that was assessed BEFORE any maintenance works occur and AFTER. The before photo should include a photo representing the 30m assessment area taken from the upper boundary of the transect facing downstream and a photo from the bottom end of the transect facing upstream. Both photos should be taken at eye height Additional photos that document biohazards, toxic and sharp objects and/or dumped items should also be taken.

As the form captures the geographic location of where the form is submitted, crews need to submit the form from the position where the assessment was carried out. This should be the upper boundary of the 30 m transect.

6.2. Qualitative Assessment

This section describes procedures for completing a qualitative litter assessment.

6.2.1. Litter Condition Scoring

The qualitative litter assessment includes four condition categories that capture a breadth of issues associated with litter and site safety. The first parameter focuses on qualitative levels of litter, the second parameter estimates threat to aquatic life, the third parameter represent risks to human health, and the last parameter represents litter being illegally dumped. Within each litter parameter, narrative language is provided to assist with choosing a condition category. Not all specific litter conditions mentioned in the narratives need to be present to fit into a specific condition category (e.g., "site frequently used by people"), nor do the narratives describe all possible conditions. The condition is divided into four condition categories that include narrative descriptions of Very Poor (8), Poor (6-7), Fair (4-5), Good (2-3) and Very Good (1). Descriptions for each of the four assessment parameters and their condition categories are outlined below.

Litter Assessment Parameters:

1. **Level of Litter.** This parameter reflects a qualitative "first impression" of the site after observing the entire length of the reach. Sites scoring in the "Poor to Very Poor" range are those where litter is one of the first things noticeable about the water body and where litter is evident in very large amounts (Table 1). Sites that score in the "Very Good to Good" range appear to have little or no litter (Table 1). To score this parameter, you need to walk the assessment area and count all the visible litter items across the transect, then use the scoring matrix to determine the level of litter score. Visual examples of litter levels for each category are shown in Attachment D.

Table 1: Condition categories for assessment parameter 1: Level of Litter.

Parameter	Very good	Good	Fair	Poor	Very poor
P1: Actual number of litter items observed in the assessment area	**< 15** litter items	**16 – 50** litter items	**51 – 150** litter items	**151- 350** litter items	**Over 350** litter items
SCORE	**1**	**3**	**5**	**7**	**8**

2. **Transportable, Persistent, Buoyant Litter.** There are certain characteristics of litter that make it more harmful to aquatic life. If litter items are persistent in the environment, buoyant (floatable), and relatively small, they can be transported long distances and be mistaken by wildlife as food items. Larger items can cause entanglement. All these factors are considered in the narrative descriptions in this assessment parameter (Table 2). In scoring this parameter, think about the litter items identified in assessment parameter 1, and determine what number would be *Transportable, Persistent, Buoyant Litter*.

Table 2: Condition categories for assessment parameter 2: Transportable, Persistent, Buoyant Litter.

Parameter	Very Good	Good	Fair	Poor	Very Poor
P2: Transportable, persistent, buoyant litter such as: hard or soft plastics, styrofoam, balloons and cigarette butts in assessment area.	**<2** pieces	**3 – 15** pieces	**16 – 55** pieces	**56 – 100** pieces	**>101** pieces
SCORE	**1**	**2**	**4**	**6**	**8**

3. **Biohazards, Toxic Items, and Sharp Objects.** This category is concerned with items that are dangerous to people and domestic animals (e.g., dogs) who recreate at the site, and with pollutants that could

accumulate in aquatic animals and plants in the downstream environment. Medical waste, nappies, and human or pet waste, paint and oil containers could potentially adversely affect water quality and the presence of such items reduces site amenity by increasing risks to human health. When scoring this parameter, think about all the litter items observed at the site, and identify what number would be considered as *Biohazards, Toxic Items, Sharp Objects* (Table 3).

4. **Illegal Dumping and Littering.** This assessment category relates to deliberate direct placement of litter items at a site, with "poor" conditions assigned to sites that appear to be dumping or littering locations, based on adjacent land use practices or site accessibility. Thus, in scoring this parameter you need to determine if litter observed in the assessment area is illegally dumped or has occurred due to downstream transport and accidental release (Table 4).

Table 3: Condition categories for assessment parameter 3: Biohazards, Toxic Items, Sharp Objects.

Parameter	Very Good	Good	Fair	Poor	Very Poor
P3: Biohazard, toxic and sharp objects such as needles, human waste, chemicals, asbestos, dead animals, paint tins/spray cans, mobile phones, or batteries, puncture and laceration hazards (broken glass and metal debris), in assessment area	No biohazard, toxic and sharp objects	**1-4** puncture and laceration hazards. **No** needles, human waste, dead animals, asbestos, batteries, paint tins/cans.	**5-10** puncture and laceration hazards. No needles, human waste, dead animals, asbestos, batteries. Presence of <5 paint /spray cans.	**1** of the following: needles, human or pet waste, dead animals, asbestos or batteries. **11-20** puncture hazards and/or **5-10** paint tins /spray cans	**>1** of the following: needles, human or pet waste, dead animals, asbestos or batteries. **>20** puncture or laceration hazards, and/or **>10** paint tins /spray cans.
SCORE	**1**	**2**	**4**	**6**	**8**

Table 4: Condition categories for assessment parameter 4: Illegal Dumping and Littering.

Parameter	Very Good	Good	Fair	Poor	Very Poor
P4: Illegal dumping and/or large items such as furniture, appliances, whitegoods, computers, TV screens, shopping trolleys, boxes or bags of garbage or garden waste in assessment area.	No evidence of illegal dumping or large litter items	Evidence of some dumping or presence of **1** large litter item	Evidence of chronic dumping or presence of **2** to **5** large litter items	Evidence of chronic dumping or presence of **6** to **10** large litter items	Evidence of chronic dumping or **>10** large litter items
SCORE	**1**	**2**	**4**	**6**	**8**

Conducting the assessment:

1. The Field Crew should first walk along the bank to observe litter throughout the assessment area. As you are walking be aware of litter under bushes, logs, and other plant growth, for items such as cigarette butts, pieces of broken glass or polystyrene foam check on the ground and substrate.
2. Count the number of litter items present and score the site for the first assessment parameter, *Level of Litter*, based on your count of the amount of litter observed. The litter condition is divided into five condition categories that include narrative descriptions of litter levels associated with a scoring range (1 – 8) as follows: Very Good (1), Good (3), Fair (5), Poor (7), Very Poor (8) (See Table 1). Use the narrative descriptions to help guide condition category score selection. Examples of

litter levels for each category are also provided in Attachment D. Note that litter that is visible outside of the assessment area should not be included in the litter condition score but can be noted in the comments section of the hard copy data sheet if required. For Survey123 users you can document litter that is illegally dumped or a biohazard, toxic or sharp occurring outside the assessment area via photos or the comments box at the end of the survey.

3. Of the litter items observed for parameter 1, decide the number of items that would be considered *Transportable, Persistent, or Buoyant Litter* to score assessment parameter 2. Use the narrative descriptions to help guide condition category score selection (See Table 2), select a score from within the condition categories for the second litter assessment parameter, *Transportable, Persistent and Buoyant Litter*.

4. Of the litter observed within the assessment area determine if any items would be considered *Biohazards, Toxic Items, Sharp Objects* or would impact on Site Accessibility/Use, such as medical waste, nappies, human or pet waste and chemical containers. Using the narrative descriptions to help guide condition category score selection (See Table 3), select a score from within the condition categories for the third litter assessment parameter, *Biohazards, Toxic Items, Sharp Objects*.

5. The last condition category is *Illegal Dumping and Littering*. Assess the area for the presence of litter items that have been directly dumped or littered at the site. Using the narrative descriptions to help guide condition category score selection (See Table 4), select a score from within the condition categories for *Illegal Dumping and Littering*.

NOTE: Team members should discuss and agree on a condition category score for each litter assessment parameter.

If using the hard copy data sheets field crews should attempt to record any comments about the site that would assist in interpreting the data collected via the qualitative assessment method. This may include, but should not be limited to, important sources or levels of litter in areas adjacent to the assessment area where the qualitative visual assessment is being conducted. Structures other than vegetation or vegetative debris that are present in the assessment area should also be described in the comments section, such as presence of storm drain outlets.

For Survey123 users you will be asked to take photos to document biohazards, toxic and sharp objects and/or dumped items in addition to a photo taken before and after any maintenance activities. You can also add additional comments in the comments box at the end of the survey.

8. Attachments

Attachment A – User Guide – Litter Condition Rating Survey123 Form

Use this guide to familiarise yourself with screen navigation and digital form features within Survey123 to complete the Litter condition rating assessment.

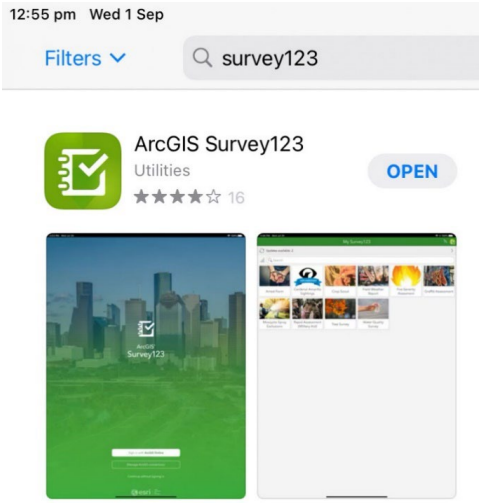
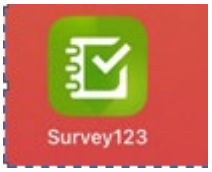
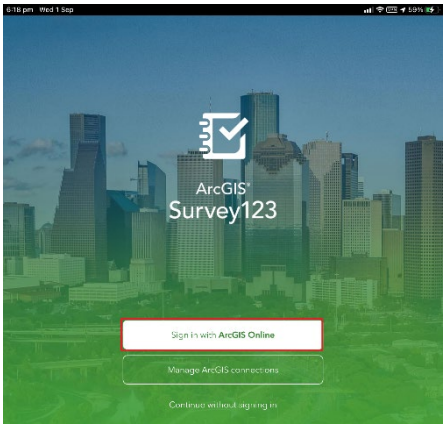
We've included information about:

Before you start you will need the following:

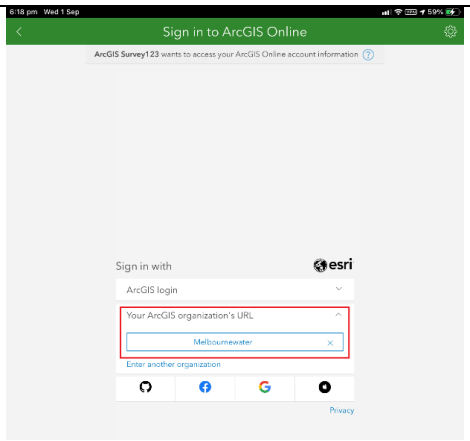
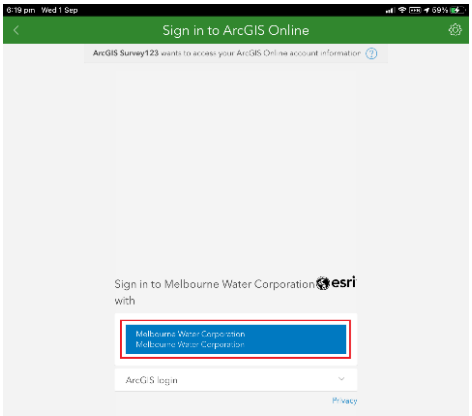
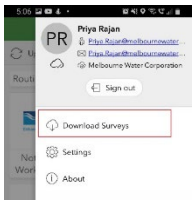
- Internet access to download **Survey123** app on to your device from Apple Store/Play Store or from Secure Hub if it is a MW device.
- If you don't have an ESRI account, Contact IT Support to request an ESRI **Username** and **Password** to log in to the **Survey123** app.

This user guide was created by Priya Rajan on 1/09/2022. It is version 1.0 Document ID: 59276591

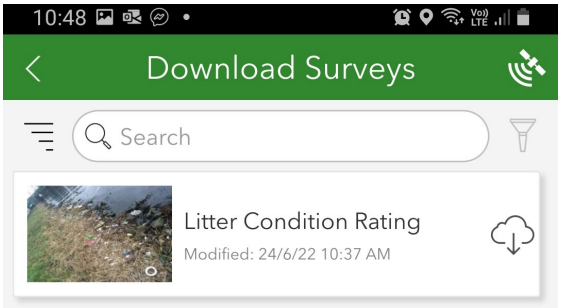
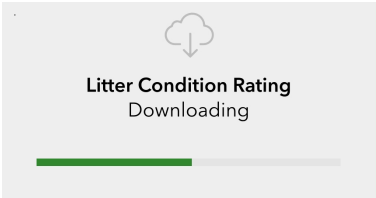
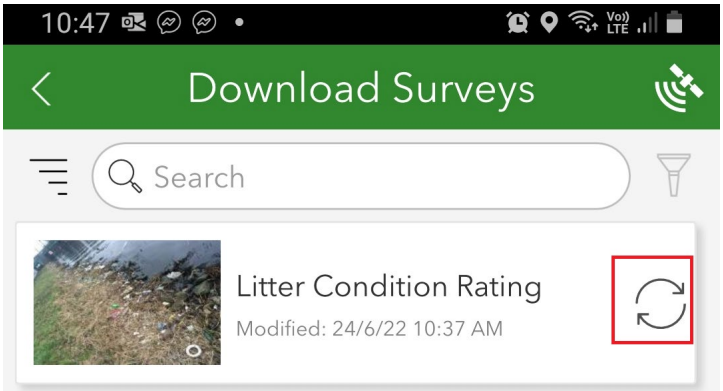
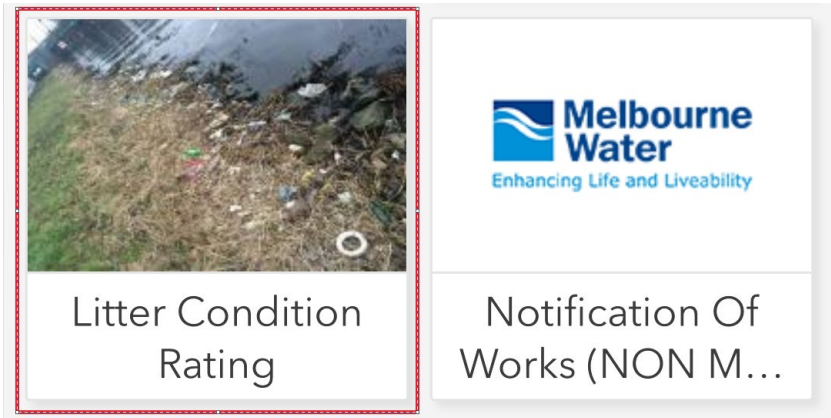
1.Download Apps & Forms

Steps	Action
1.	From your device, open the Apple Store or Google Play Store and download the app. 1. **ArcGIS Survey123** 
2.	Once downloaded the icon is available on your device. Click to open. 
3.	Click **'Sign in with ArcGIS Online'** 
4.	Choose 'Your ArcGIS organization's URL' and select or enter '**melbournewater**' then click **Continue**

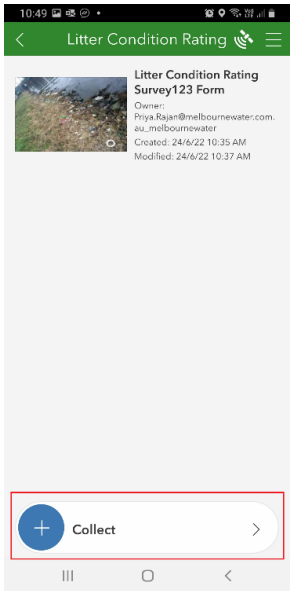
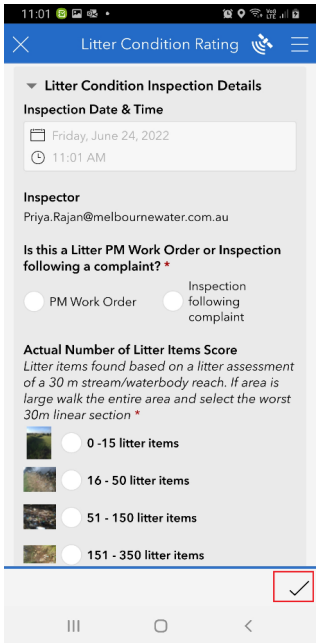
1.Download Apps & Forms

Steps	Action
	
5.	Click **'Melbourne Water Corporation'**  Your ArcGIS Account is AD Authenticated so if you are asked for a password, enter your Network (AD) password and follow the steps for your security verification.
6.	Download the '**Litter Condition Rating**' form: a) In the Survey123 app, click on your 'Initials' icon to display **Download Surveys** b) Click **Download Surveys** to see the list of Survey123 forms available on your profile Ensure you have an internet connection and if your required Survey123 form is not displaying, contact IT Support.  

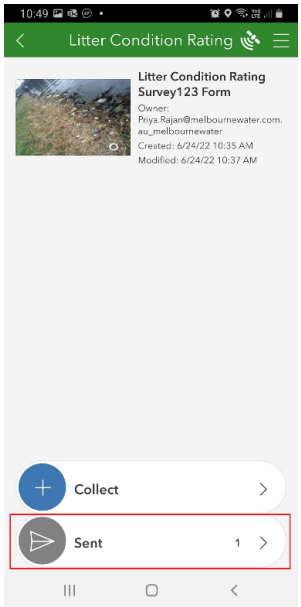
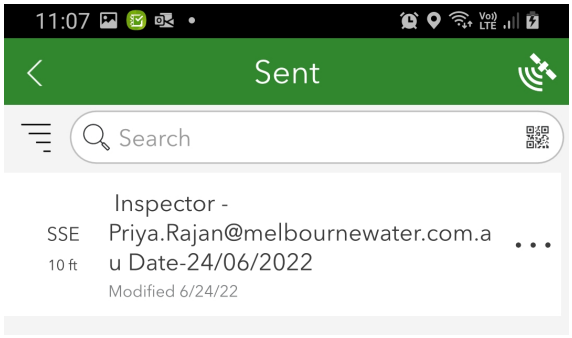
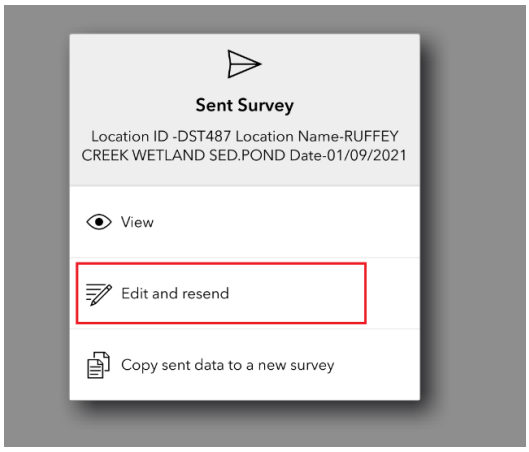
1.Download Apps & Forms

Steps	Action
7.	Select the **'Litter Condition Rating'** form using the download icon.  
8.	After the download, the icon changes. Return to the 'My Survey123' page using the 'Back Arrow'. 
9.	The **'Litter Condition Rating'** Survey123 form has downloaded successfully and is now ready to use. 
	End of steps

2. Accessing the Form

Step	Action
1.	Open **'Litter Condition Rating'** form and click **'Collect'** 
2.	**'Inspection Date & Time'** and **'Inspector'** fields are auto populated and are read only. Enter all the mandatory fields and click the ✓ to submit the form. 
	End of steps

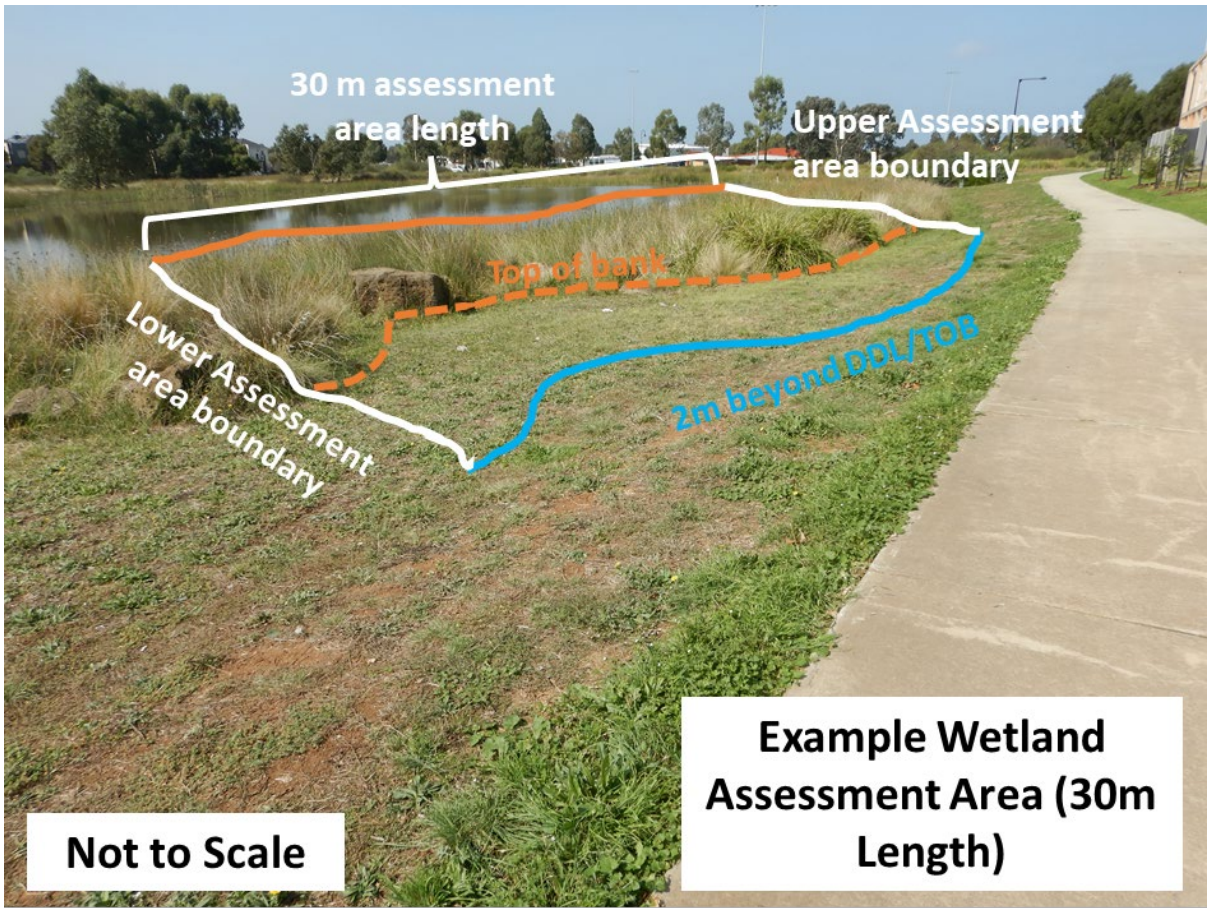
3. Survey123 Form – Edit submitted Record

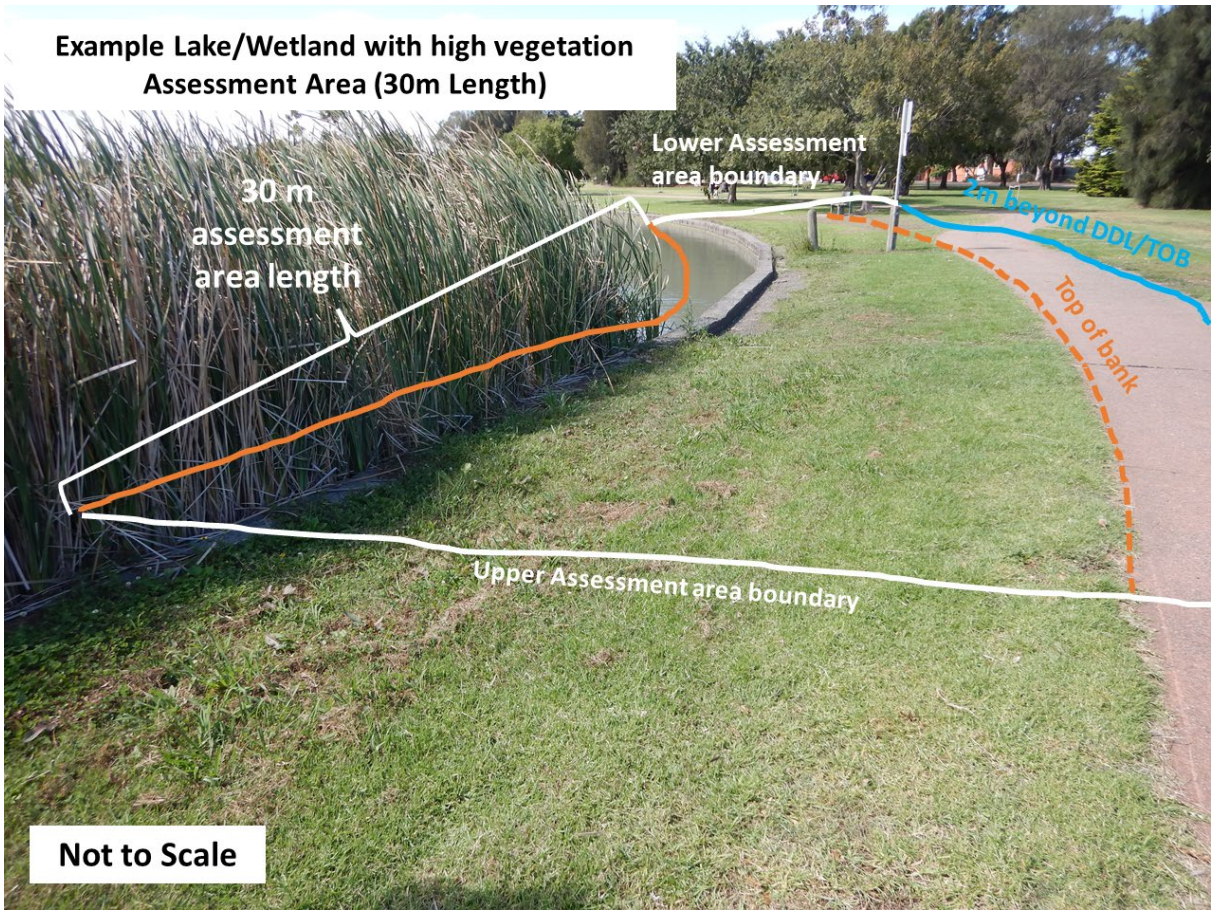
Step	Action
1.	From the **Survey123** app, click the **'Litter Condition Rating'** and select '**Sent**'. 
2.	All the successfully submitted records display in the **Sent** folder. Select the record you wish to edit and click "**Edit and resend**". Note the location coordinates of where information was **first captured** will not change against the record.  
	End of steps

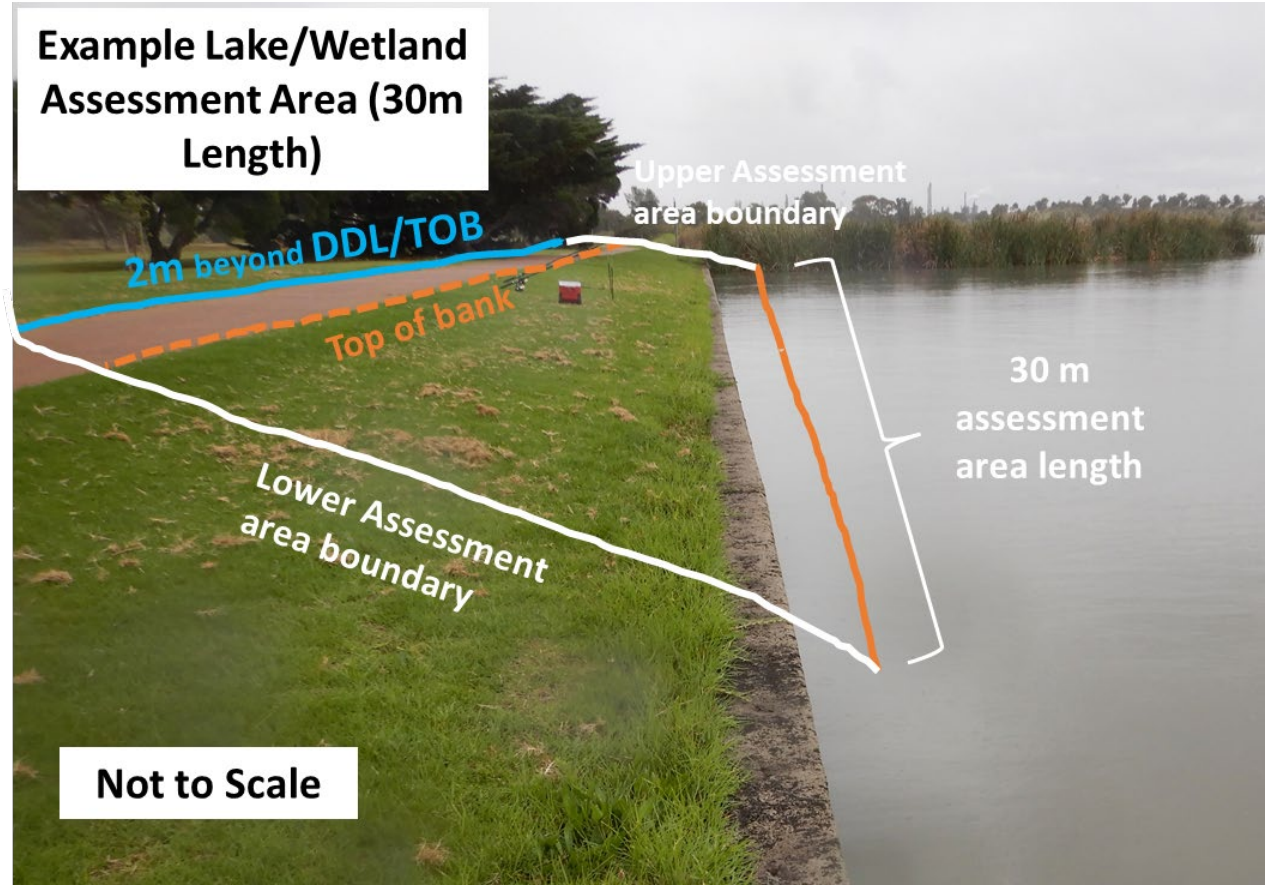
Attachment B – Qualitative Litter Assessment hard copy data sheet

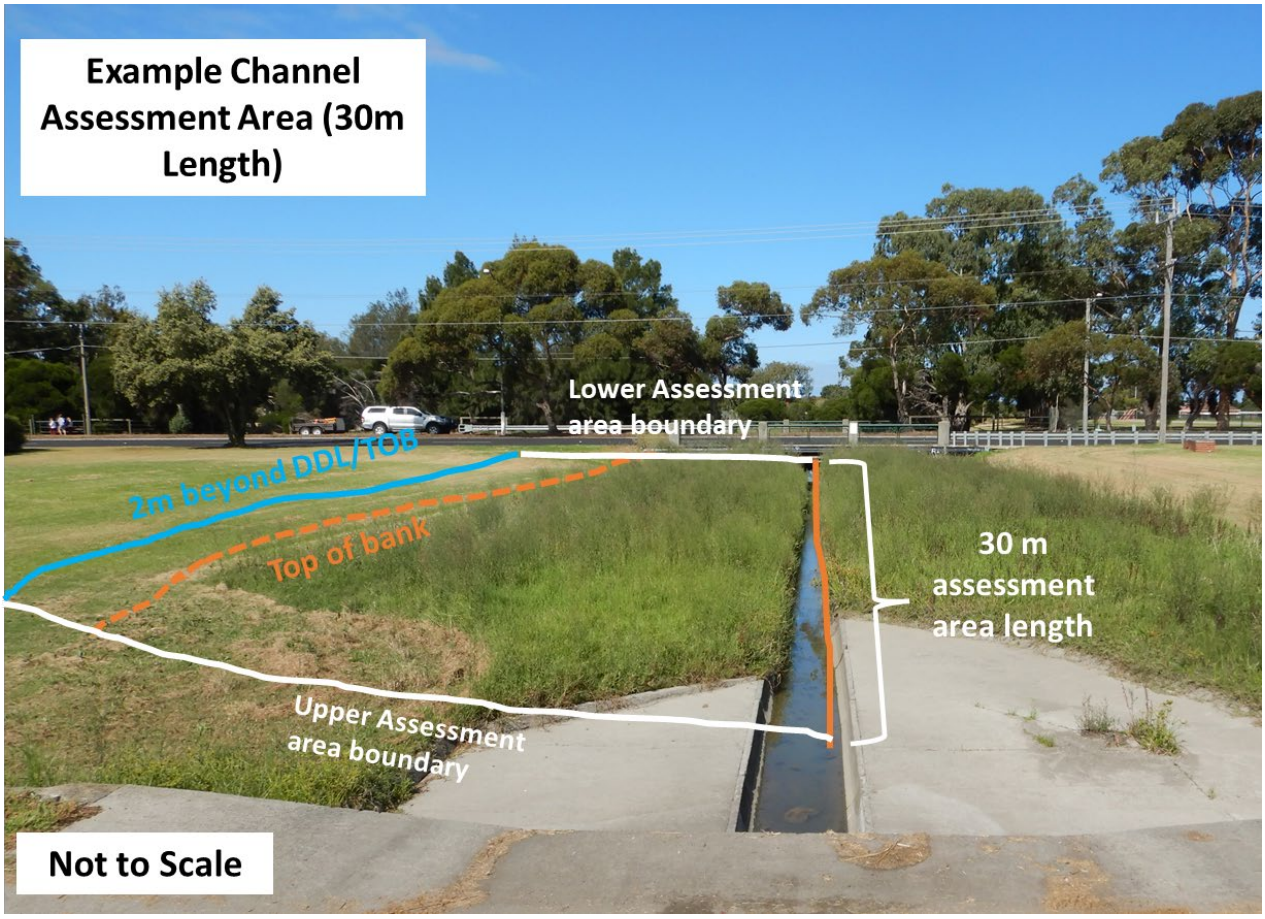
Litter Characterisation Site Information Sheet	
Assessment Area Information	
Organisation	
Surveyor Name/s	
Contact Number	
Contact Email	
Waterbody Name	
Site Number	
Site Code	
Date	
Number of Surveyors	
Start time	
End Time	
Upper boundary assessment area (latitude and longitude)	
Lower boundary assessment area (latitude and longitude)	
Upper boundary transect width (m)	
Comments	
Mid transect width 9m)	
Comments	
Lower boundary transect width (m)	
comments	
Site Conditions	
Evidence of Current flooding or high flows (circle appropriate, if **YES** comments)	Yes No
Evidence of dumping at site (circle appropriate)	Construction Household Green waste Car/auto parts Whitegoods Other:
Comments	
Evidence of recent activities within survey area (circle appropriate)	Clean-up or litter removal litter spilled mowing storm/flood public event high winds other:
Cleanliness at first sight	
Comments	
Qualitative Litter Assessment parameter responses	
Actual number of litter items	
Transportable Persistent, buoyant Litter	
Biohazard, toxic and sharp objects	
Illegal dumping	
Total score (1+2+(3x1.8)+4)	

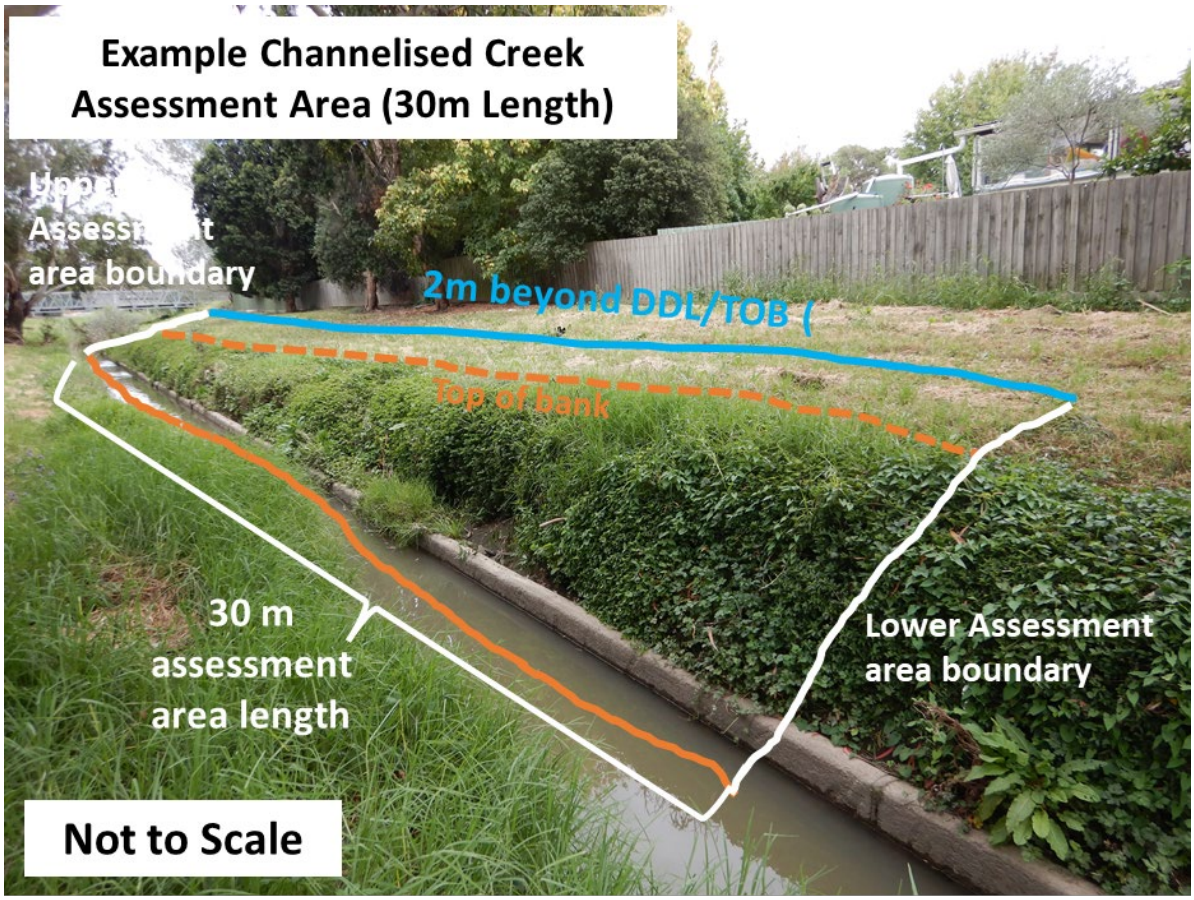
Attachment C: Guidance for defining Litter Assessment Areas

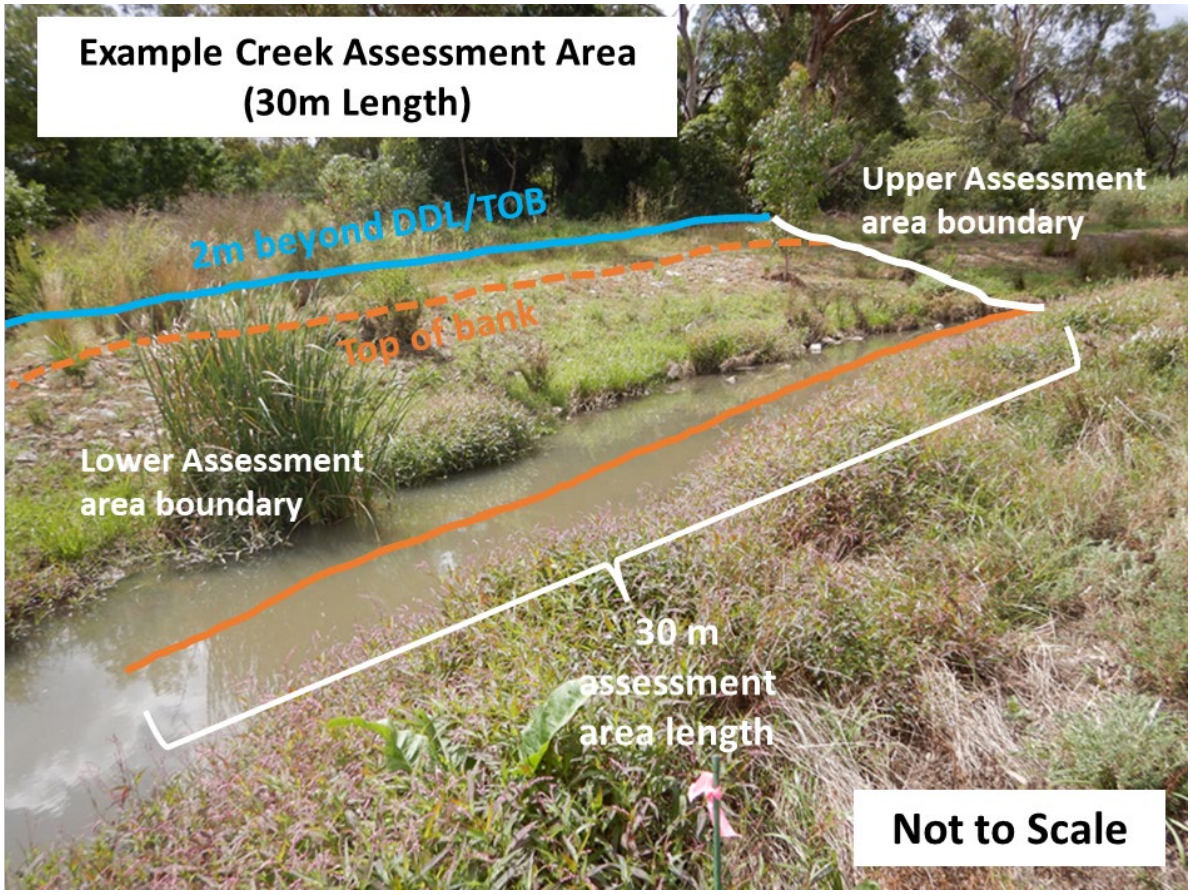

30 m assessment area length
Upper Assessment area boundary
Top of bank
Lower Assessment area boundary
2m beyond DDL/TOB
Example Wetland Assessment Area (30m Length)
Not to Scale

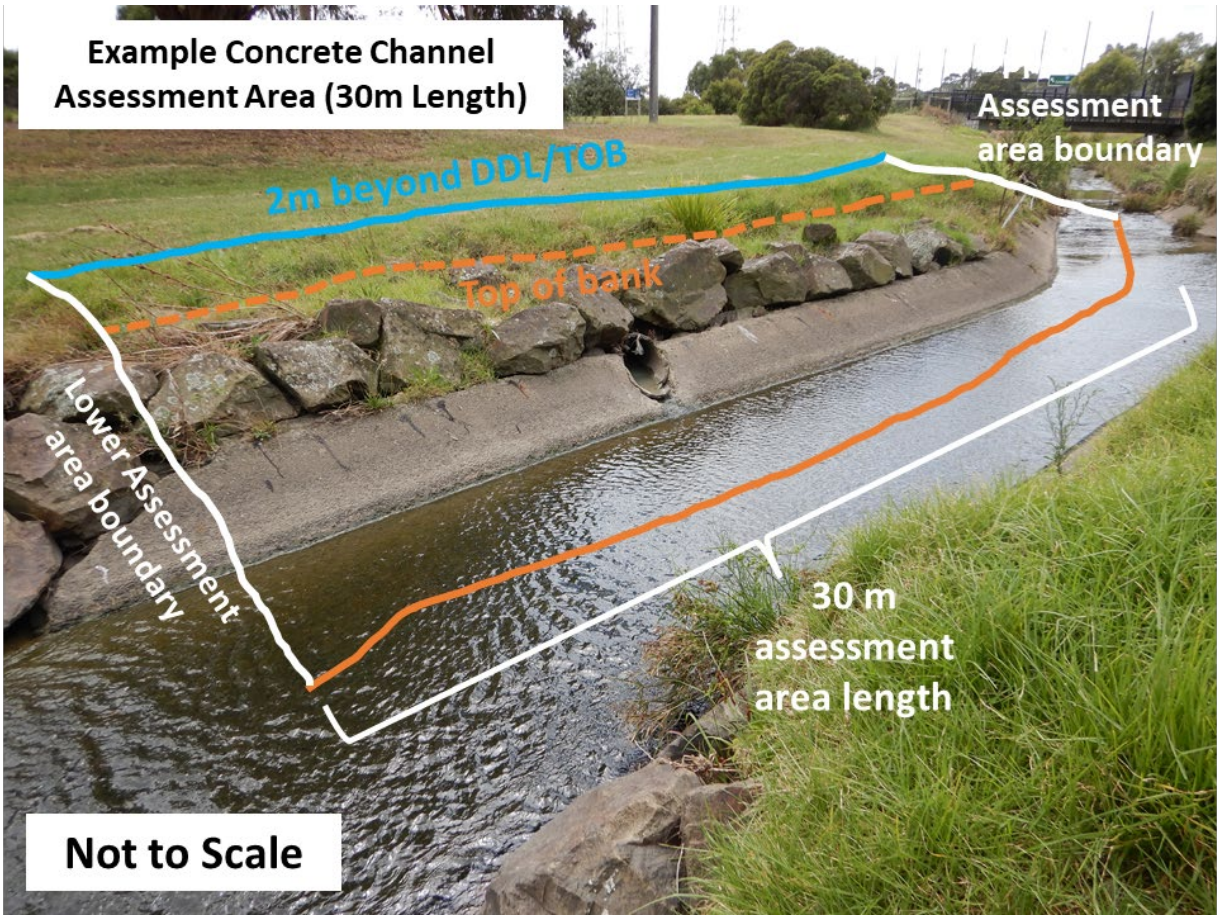

Example Lake/Wetland with high vegetation Assessment Area (30m Length)
Lower Assessment area boundary
30 m assessment area length
2m beyond DDL/TOB
Top of bank
Upper Assessment area boundary
Not to Scale

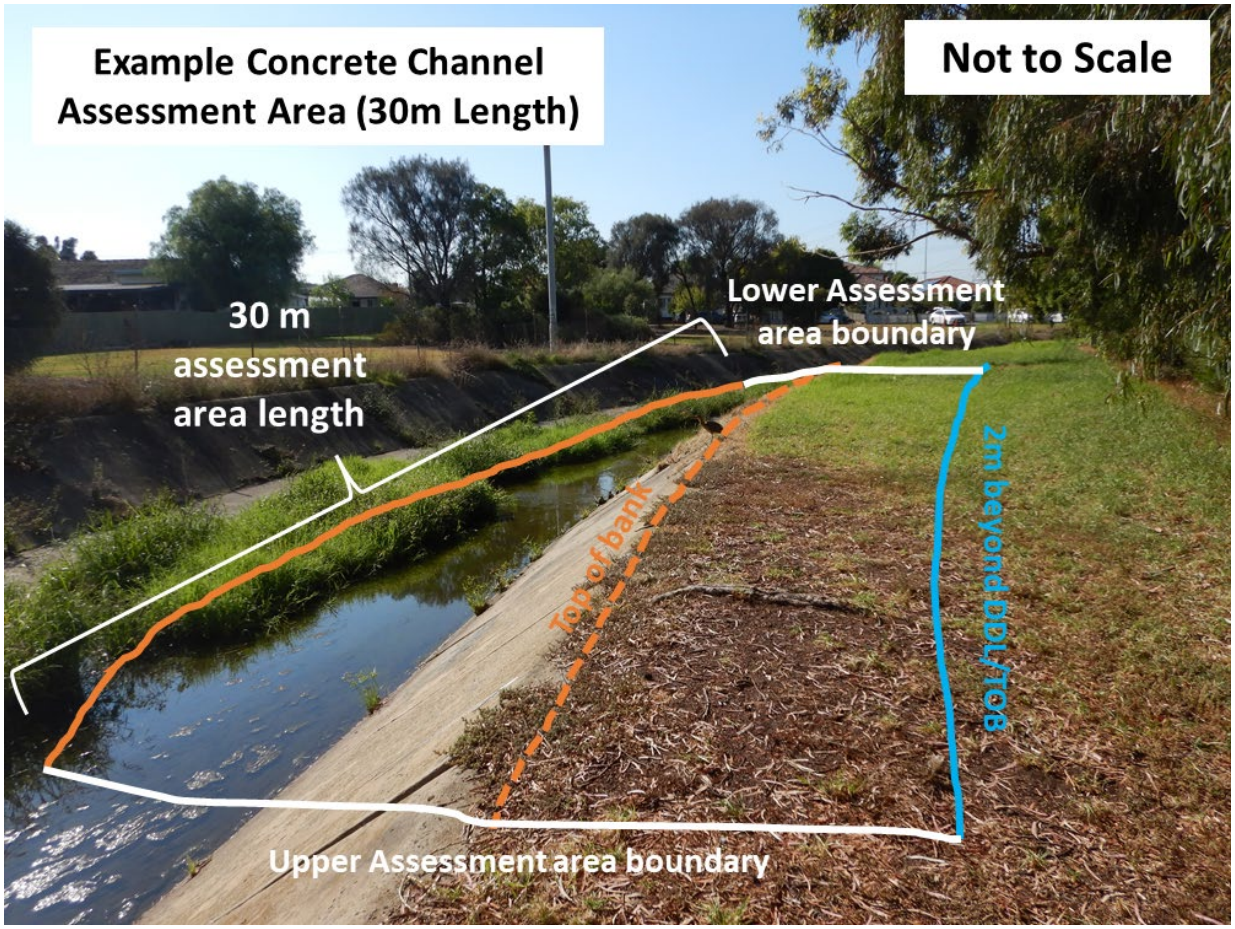

Example Lake/Wetland Assessment Area (30m Length)
Upper Assessment area boundary
2m beyond DDL/TOB
Top of bank
30 m assessment area length
Lower Assessment area boundary
Not to Scale


Example Channel Assessment Area (30m Length)
Lower Assessment area boundary
2m beyond DDL/TOB
Top of bank
30 m assessment area length
Upper Assessment area boundary
Not to Scale


Example Channelised Creek
Assessment Area (30m Length)
area boundary
2m beyond DDL/TOB (
Top of bank
30 m
assessment
area length
Lower Assessment
area boundary
Not to Scale


Example Creek Assessment Area
(30m Length)
Upper Assessment
area boundary
2m beyond DDL/TOB
Top of bank
Lower Assessment
area boundary
30 m
assessment
area length
Not to Scale


Example Concrete Channel
Assessment Area (30m Length)
Assessment
area boundary
2m beyond DDL/TOB
Top of bank
Lower Assessment
area boundary
30 m
assessment
area length
Not to Scale


Example Concrete Channel
Assessment Area (30m Length)
Not to Scale
30 m
assessment
area length
Lower Assessment
area boundary
Top of bank
2m beyond DDL/TOB
Upper Assessment area boundary

Attachment D: Guidance for Assessing Litter Condition

VERY GOOD LITTER LEVEL CONDITION

Effectively no or very little litter present. Little or no litter is visible. Less than 15 litter items or no litter is evident in the waterbody or on the banks when closely examined for litter and debris. One individual could easily remove all litter observed within 10 minutes.

GOOD LITTER LEVEL CONDITION

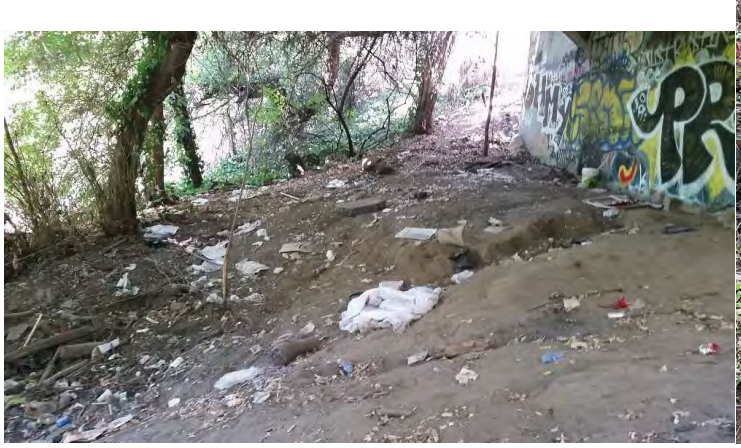
The site is predominantly free of litter except for a few scattered pieces. Litter is visible but not obvious. After closer inspection, between 16 and 50 litter items are evident along banks and/or in waterbody. On average, all litter could be cleaned up by two individuals within 30 minutes. Approximately 2-3 times more litter than the very good condition category.

FAIR LITTER LEVEL CONDITION

Predominantly littered except for a few clean areas. Litter is evident in moderate levels. After close inspection, more than 51, but less than 150 litter items are evident on the banks and/or within the waterbody. On average, all litter could be cleaned up by two individuals within one hour. Approximately 2-3 times more litter than the good condition category.

POOR LITTER LEVEL CONDITION

Predominantly littered across study area. Litter is evident in high levels along the banks and/or within the waterbody. Evidence of site being used by people: scattered cans, bottles, food wrappers, plastic bags, etc. with between 151 and 350 litter items evident across the site. On average, would take a more organized effort (more than 2 people, but less than 5) to remove all litter from the area. Removal of litter would take 1 to 2 hours. Approximately 2 times more litter than the fair condition category.



VERY POOR LITTER LEVEL CONDITION

Litter is continuously seen throughout the assessment area. Litter distracts the eye. Substantial levels of litter and debris (>350 litter items) occur along the banks and/or in the waterbody. Evidence of site being used frequently by people (e.g., many cans, bottles, food wrappers, plastic bags, clothing; piles of garbage and debris), or that there has been substantial transport of litter to the site during flooding and high flows. On average, would take many people (more than 5) during an organized effort to remove all litter from the 30m assessment area. Removal of all litter would take more than 2 hours. Approximately 2 or more times litter than the poor condition category.