

Sediment Task Force



TOOLS AND ACTIONS TO ASSIST LOCAL GOVERNMENTS TO MANAGE THE ENVIRONMENTAL AND FINANCIAL IMPACTS OF SEDIMENT LOSS RESULTING FROM URBAN DEVELOPMENT



**BRONWYN SCALLAN, SEDIMENT TASK FORCE
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Photographs courtesy of the “Cities” of Augusta Margaret River, Bayswater, Cambridge, Cockburn, Kalamunda, Subiaco, Swan and WESROC, DBCA, DWER, HLW, Main Roads, SERCUL, UWA and Perth NRM.

PRESENTATION OUTLINE

- ❑ Magnitude of the problem (examples).
- ❑ Financial impact (examples).
- ❑ Tools and actions used by Local Governments in WA and interstate to effectively manage erosion and sediment loss during urban development (examples).
- ❑ Success factors of Local Governments who are doing this well.
- ❑ Sediment Task Force Resources for Local Government.



MAGNITUDE OF THE PROBLEM (EXAMPLES - AUSTRALIA)

- ❑ Paucity of research.
- ❑ *Healthy Land Water 2018/19*
 - Sediment entering waterways is **number one issue affecting water quality** in South East Queensland.
 - **Annually over 50,000 dump trucks worth of sediment** enters SE QLD's waterways.
 - Effective control of erosion and sediments on building sites **prevents the loss of approx. one tonne of soil on a 500m² lot.**
 - This equates to **one dump truck load less soil lost for every 10 houses built.**



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MAGNITUDE OF THE PROBLEM (EXAMPLES - AUSTRALIA)

- ❑ *Derwent Estuary Report 2009 (Tasmania)*
 - **8,000 milligrams/L Total Suspended Solids (mostly sediment)** delivered to estuary via stormwater runoff **every year**, with a **large percentage of load attributed to erosion from building and construction sites.**
- ❑ *Preliminary Results from UWA/CRCWSC/STF sediment research*
 - **6 tonnes** building sand ended up in the drain during storm event 2018
Consistent SE QLD data - **1 tonne lost** (70 buckets)/**average sized house site.**



IT'S NOT JUST SOIL

- ❑ Surface runoff from urban development, particularly where prior land use was agricultural, horticultural and/or industrial, also transports pollutants including oils, heavy metals, nutrients, bacteria and litter into local waterways.

ECU/STF LGO SURVEY 2017 (PERTH)

AN INSIGHT INTO WHAT IS REALLY HAPPENING “ON THE GROUND”

- ☐ 70% of Local Government Officers (LGOs) participating in the survey considered sediment loss from building sites is an issue for their LG;
- ☐ 29% of LGOs believed **no** erosion control infrastructure is being used by builders in their area;
- ☐ 33% of LGOs believed their Local Government’s Local Laws are ineffective in preventing erosion and sediment loss;
- ☐ 61% of LGOs unaware or unsure of the existence of their Local Law for sediment loss;
- ☐ Evidence of Local Laws not being utilised due to a lack of ownership by the various departments within LG;
- ☐ Many LGOs did not believe their Local Governments’ compliance process was effective; and
- ☐ Evidence of great reliance on responding to complaints and LGO observance, due to lack of resources.



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EXTENSIVE (OFTEN UNBUDGETED) TIME & MONEY SPENT BY LGAS

- ❑ On... sweeping roads, repairing & maintaining stormwater & Water Sensitive Urban Design infrastructure, responding to public complaints and remediating/restoring environmental assets.
- ❑ **“High growth” Local Government - \$642,000 budget for 2018-19:**
 - \$375,000 budgeted for cleaning drainage pits and lines full of sand within new subdivisions.
 - \$267,000 budgeted for street sweeping of new subdivision stages after residential building.
- ❑ **“High growth” Local Government – cleaning of infrastructure:**
 - Pipe blocked by sand & rubble costing \$5400.
(**\$387 per lineal metre**).
 - \$15,000 budgeted maintain drains where builders sediment has run-off and been captured.
(Represents 10% of their annual drainage maintenance budget).
- ❑ **“In-fill” Local Government – manual “cleaning” of iconic wetland:**
 - 17 Tonnes gross sediments removed at cost of \$36,000 annually.



TOOLS AND ACTIONS USED BY LOCAL GOVERNMENT TO MANAGE EROSION AND SEDIMENT LOSS DURING URBAN DEVELOPMENT - WA EXAMPLES

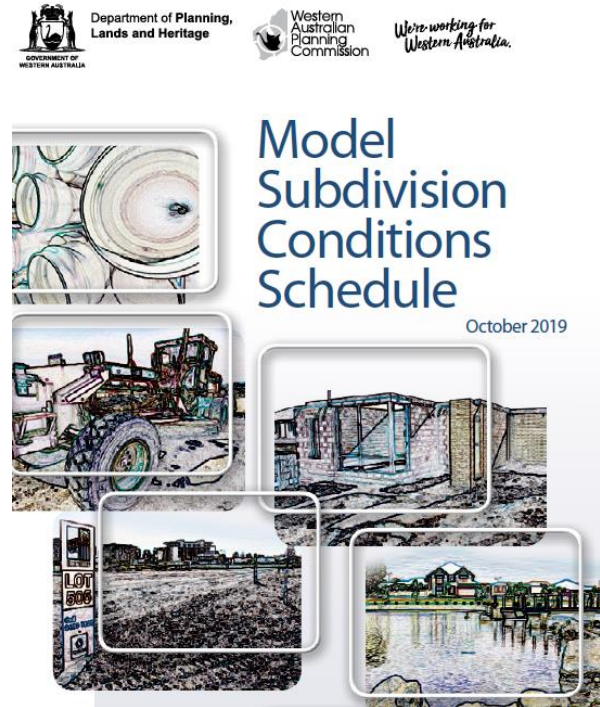
Main objective of all tools and actions is to ensure builders/developers/road construction managers:

- ☐ Minimise the amount of sediment and contaminated water leaving site;
- ☐ Minimise disturbance during land use development activities;
- ☐ Preserve existing vegetation where possible;
- ☐ Undertake prompt rehabilitation of sites;
- ☐ Immediately install erosion and sediment control (ESC) infrastructure on site and plumb downpipes; and
- ☐ Inspect/maintain erosion and sediment control infrastructure for functionality daily and immediately after a rainfall event.



LEGISLATION/REGULATION THE PRIMARY TOOL

- ❑ In WA, sediment discharge is not generally regulated by the State Government. **There are however legislative provisions:**
 - Department of Water and Environmental Regulation (DWER) *Unauthorised Discharge Regulations 2004*
 - *Planning and Development Act WA 2005*
 - *Department of Planning, Lands and Heritage and the Western Australian Planning Commission's **Model Subdivision Conditions Schedule** May 2019.*
- ❑ Local Government also regulates erosion, sediment runoff and sand drift through Local Laws (*Local Government Act 1995*), policies, guidelines, planning approvals, conditions, permits, management plans etc.
- ❑ Local Laws specific to erosion and sediment control are proving more effective due to increased clarity & streamlined enforcement process.



INVESTMENT IN INFRASTRUCTURE TO CAPTURE SEDIMENT RUNOFF

- ❑ Existing erosion and sediment control (ESC) infrastructure is being improved and new ESC infrastructure and innovations are being developed and installed across Australia.
- ❑ Examples include Gross Pollutant Traps, Drainage Pit/s, Sumps, Detention Basins, Catch Basin Inserts, Stormwater Inlet Filters, Sediment Traps, Soak Wells and Diversion Drains.

City of Bayswater and Subiaco

- ❑ Significant investment in ESC infrastructure and in trialing new technologies to capture and remove sediment to improve water quality.



RESTRICTIONS ON THE TIMING AND STAGING OF BULK EARTHWORKS

City of Kalamunda

- ❑ Bulk earthworks not encouraged for class 3 and 4 development sites between October to March; and
- ❑ Bulk earthworks encouraged to be done in stages.

City of Cockburn

- ❑ Moratorium on land clearing on large scale development during the summer months in recognition that best practice procedures cannot prevent windblown sand and dust leaving development sites due to strong seasonal winds.



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ASSET PROTECTION BONDS

City of Kalamunda

- ☐ Collection of an Asset Protection Bond (in excess of \$20,000) for subdivision, demolition or land clearing.
- ☐ Includes a requirement to address dust, sand drift and sediment loss.



SPECIAL CONDITIONS ON BUILDING PERMITS

City of Kalamunda

Sand or similar material spread onto the road surface or washed into street drains will be removed by the City without notice and the costs charged to the Owner or the Builder, and may include penalties.



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VERGE PERMITS/INFRASTRUCTURE AND VERGE PROTECTION BONDS

- ❑ Many Local Governments require a permit to store building materials on verge, with special provisions for the abatement of sediment, sand drift and dust.
- ❑ *City of Kwinana* - verge permit for an average lot \leq \$1000 pa
- ❑ *City of Stirling* - Verge inspections before and after building works (\$200 each) and refundable verge protection bond of \$1500.
- ❑ *City of Subiaco* - refundable VP bond of \$3000.
- ❑ *Town of Cambridge* - Verge Permit fees \$5.50m²/per month.



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HIGH LEVEL OF SUPPORT TO LAND DEVELOPERS AT INITIAL PLANNING STAGE

City of Swan

1. *Start-up Meetings* held with land developers prior to the commencement of all new subdivision developments.
2. Land developers also required to carry out regular meetings with the City of Swan and undertake regular site inspections.



MONITORING

City of Subiaco

- ☐ Planned audit of materials collected by street sweepers and soak wells so the City can map sediment movement and quantities.
- ☐ Data to be used to develop new and innovative preventative solutions for controlling and managing sediment.

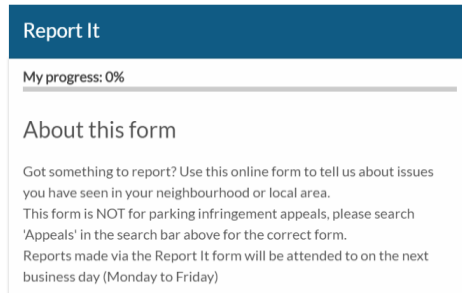
City of Bayswater

- ☐ Conditions of approval for development sites incl. air monitoring stations with alarm (dust).

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TOOLS FOR COMMUNITY REPORTING OF SEDIMENT LOSS

Town of Cambridge – *Report It* (online)



The screenshot shows the 'Report It' online form interface. At the top, there is a blue header with the text 'Report It'. Below the header, a progress bar indicates 'My progress: 0%'. The main content area is titled 'About this form' and contains the following text: 'Got something to report? Use this online form to tell us about issues you have seen in your neighbourhood or local area. This form is NOT for parking infringement appeals, please search 'Appeals' in the search bar above for the correct form. Reports made via the Report It form will be attended to on the next business day (Monday to Friday)'.

City of Kwinana trial (Mobile App)



EDUCATION

- ☐ Guidelines for builders and developers (various LGAs).
- ☐ Shire Augusta/Margaret River - Sediment management workshops for staff and the building and construction industry.
- ☐ Shire Augusta/Margaret River - Information Sheets and Enforcement Checklist.
- ☐ City of Gosnells – “Doing it Right on Site” web page.



VOLUNTARY HYDRO-MULCHING OF VACANT BLOCKS - CITY OF COCKBURN

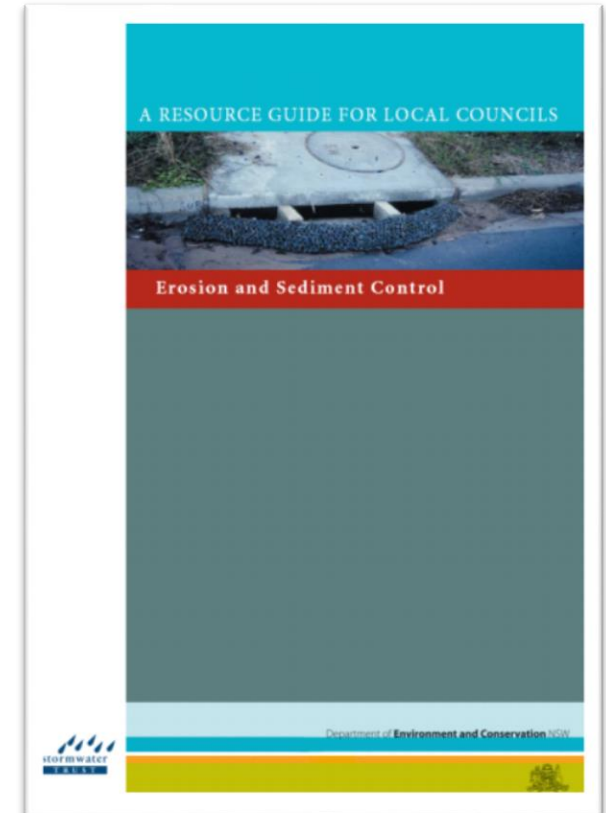
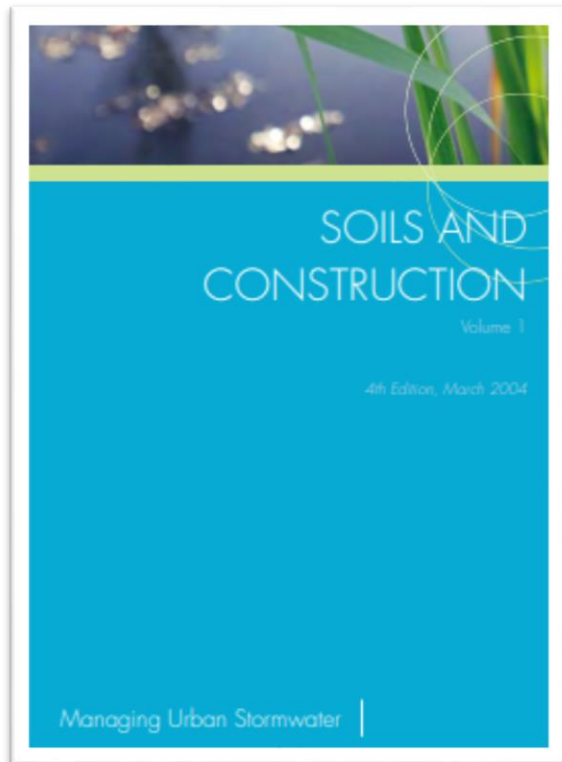
- ☐ Hydro-mulching scheme organised by the City immediately after land clearing for subdivision.
- ☐ Discount for hydro-mulching secured for landowners of vacant blocks.
- ☐ 70% of landowners of vacant blocks signed up, greatly reducing the occurrence of sand drift and dust.
- ☐ Landowners who chose not to participate will be required to pay the full cost of hydro-mulching and cleaning up costs if complaints are received.
- ☐ Community feedback positive – saw this as a proactive approach by the City to assist its ratepayers by minimising dust nuisance and sand drift onto neighbouring properties.



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TOOLS AND ACTIONS – INTERSTATE EXAMPLES

Various and numerous ESC guidelines, technical specifications, toolkits, information sheets etc.



INTERNAL PERFORMANCE REVIEWS (AUDITS)

Many Local Governments interstate are using these to **assess the effectiveness of their internal management systems** for managing erosion and sediment loss resulting from urban development.

- ☐ Audits evaluate Council work procedures, compliance mechanisms, risk management and reporting processes & field-based training needs.
- ☐ Used for both private urban development projects being assessed by Councils for approval and for Council Infrastructure Projects.
- ☐ Building staff capacity has often been identified as the number one strategy to enable Councils to ensure effective erosion and sediment control on subdivision, building and construction sites.



INDUSTRY EDUCATION, TRAINING AND COMPLIANCE CAMPAIGN

Derwent Estuary Erosion and Sediment Control Project (Tasmania)

- ❑ “Critical elements” to improve ESC on sites are **education, training & enforcement**;
- ❑ **Information Fact Sheets & ESC Best Practice Field Guide**;
- ❑ **“Sediment control kits”** - ESC products assessed for useability and cost. Filter socks & filter bales chosen and **3,500 issued** to builders (free) and council staff briefed use;
- ❑ Delivery of **training** for council work crews;
- ❑ **Soil & Water Management Plan now required** for subdivisions or activities $\geq 250\text{m}^2$ of ground disturbance; and
- ❑ **Regional Sediment and Erosion Control Officer employed** to work with councils and the building industry to improve soil and water management practices.
- ❑ Role includes site inspections, new system of regulation and new training programs for building practitioners and council staff in regulatory roles.



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BUILDING INDUSTRY COMPLIANCE, EDUCATION AND TRAINING CAMPAIGNS

- ❑ Coordinated in partnership by local councils, state government, the building industry and community conservation groups.



(NSW). Key component annual *Sediment Blitz* (Parramatta Council/EPA). (27 orgs).
2016 - 50% sites compliant; 2017 – 51% sites compliant.
2018 - 75% sites compliant; 2019 - 63% sites compliant.

- ❑ Home builders & renovators must submit ESC Plan before works begin and they are required to ensure their builders adhere to the rules.



(SA) Delivers education & training embracing best practice on construction sites via onsite demonstrations and information resource materials.
Focus on ESC, stormwater management, resource recovery and trade practices.



- ❑ **(SE QLD)** On site training for builders in Best Management Practice ESC, incident reporting, site inspection and ESC infrastructure maintenance. Sediment loss field trials and online resources.



FINANCIAL DISINCENTIVES

❑ New South Wales - Local councils and the Environment Protection Authority have the power to issue penalties from \$8000 to \$15,000 for each incident.

(WA Local Laws typically \$100-\$500; Maximum \$5000).

❑ *Sediment Blitz*

- 2016 - \$127,000 fines for non-compliance issued for 204 sites.
- 2018 - \$212,000 in fines issued from 746 site inspections.
- 2019 - \$291,000 in fines issued from 784 site inspections.

❑ Queensland - “Graduated penalties” to be introduced:

- “Sliding scale” of fees;
- Fines issued based on extent of impact and level of risk of environmental harm; and
- Further penalties for repeat offences.

Construction industry getting the site right as run-off blitz records improvement

07 August 2019

Building sites are getting the message and improving their environmental performance, according to the latest results of the Get the Site Right sediment control campaign.

Running run-off out of town: one-day blitz on building site waterway controls

02 October 2019

Hundreds of building sites across Sydney and the Central Coast will be inspected on October 15 as part of a blitz to protect local waterways from run-off.

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SUCCESS EVIDENT WHEN LOCAL GOVERNMENT EFFECTIVELY:

- ❑ Focuses on what is **locally relevant and important**;
- ❑ **Reviews and improves** their regulatory framework, compliance, planning and reporting procedures, documentation, incentives and financial disincentives (to act as deterrent);
- ❑ Aims for **compliance that reflects policy and best practice standards**;
- ❑ Secures **corporate ownership and commitment** (senior mgmt level);
- ❑ Achieves **cross-department awareness** of issue and knowledge of ESC management tools, strategies & infrastructure, and **departments work together** to monitor and enforce compliance;
- ❑ **Empowers** all staff able to observe potential breaches to have the **knowledge, skills and authority to report incidents** of non-compliance;
- ❑ Implements a **centralised incident reporting system** to quickly resolve breaches and to assess collective impacts (including downstream impacts);



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SUCCESS EVIDENT WHEN LOCAL GOVERNMENT EFFECTIVELY:

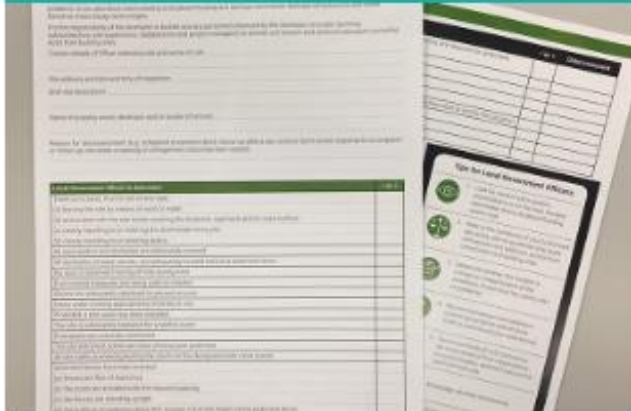
- ☐ Provides high quality education and training to **build staff and industry capacity**;
- ☐ **Invests in infrastructure** to capture the “sediment that got away”;
- ☐ Aims for **cost recovery** for this investment;
- ☐ **Commits to regular assessments** (eg water quality monitoring, drainage infrastructure damage checks, sediment source investigations, analyse investment in environmental restoration);
- ☐ Identifies key **barriers** to successful management and adopt new strategies to overcome these;
- ☐ **Does not rely on the goodwill** of builders and developers to voluntarily adopt best practice erosion and sediment control measures;
- ☐ Proactively **assists** builders and developers to **understand and fulfil their obligations**; and most importantly
- ☐ Secures a **sufficient level of resourcing** to ensure on-site compliance.



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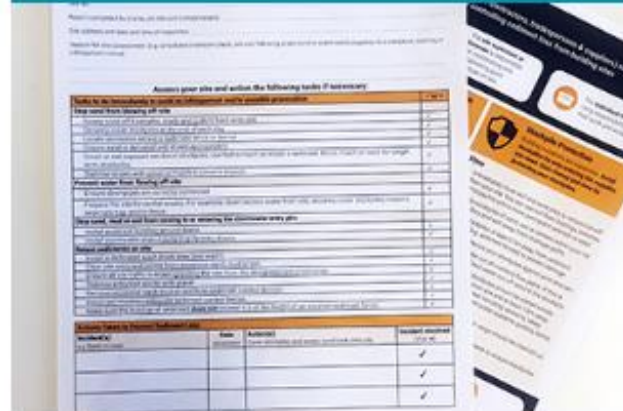
SEDIMENT TASK FORCE RESOURCES FOR LOCAL GOVERNMENTS IN WA

Local Government Tool for Sediment Management



Developed with guidance/advice from LGOs at the Cities of Armadale and Gosnells. Pdf and editable on line versions.

On-Site Builders Checklist for Preventing Sediment



Referral to this checklist in DBCA's *Standard Advice Notes for subdivision condition* (Minimisation of risk of erosion and sedimentation impacts into nearby water bodies).

AUGUST 2019

SUMMARY REPORT

Results of the Edith Cowan University's survey:
LOCAL GOVERNMENTS' RESPONSE TO
SEDIMENT LOSS FROM BUILDING SITES



Survey data analysis, conclusions & BMP recommendations for Local Governments in WA.

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SEDIMENT TASK FORCE RESOURCES FOR LOCAL GOVERNMENTS IN WA LOCAL GOVERNMENT'S RESPONSE TO EROSION FROM URBAN DEVELOPMENT

Development Design Specifications for Erosion Control and Stormwater Management a very successful tool for controlling sediment loss from subdivision development sites



Our success factors for controlling erosion, sediment runoff, sand drift and dust during subdivision

- 90% of large scale subdivision sites in the City of Swan are estimated to be compliant with the City's Development Design Specifications related to erosion and sediment control, and stormwater management. This is due to:
1. Our strong commitment to ensuring compliance with our Development Design Specifications
 2. A high level of support being offered to land developers by the City at the initial planning stage
 3. The requirement for land developers to refer to expert technical manuals and guidelines for stormwater management when submitting their subdivision and construction plans.

Ensuring compliance with our

Sediment runoff draining straight into the Swan River

Sediment runoff and sand drift from building sites is a concern in the City of Swan due to builder's sand entering stormwater systems and becoming sediment.



Addressing sediment loss from building sites at its source



Report It allows the community to assist in reporting sediment loss

In 2010, the Town of Cambridge introduced a new community feedback initiative called Report It, whereby residents are able to inform the Town of Cambridge of issues of concern they observe in their neighbourhood or local area, including those related to construction sites such as dust, sand drift and sediment loss from building sites.

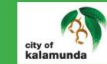
Report It was introduced by the Town as a simple way for residents to report issues online, which was also reportable in terms of quantity. Having written records also allows the Town of Cambridge to be more accountable with their responses. This in turn reduces the number of calls received where residents claim to have reported the issue previously with no action resulting.

In 2018/2019, the Town received 725 Report It cases across the entire organisation.

To effectively capture sediment, geotextile material needs to be secured to the perimeter fence at a minimum height of 600mm

Our success factors for preventing and managing sediment loss from building, subdivision and construction sites

- 98% of building sites in the Town of Cambridge are estimated to be compliant with the Town's regulations and conditions for preventing and managing soil erosion, surface runoff, sand drift and dust. This is due to:
1. Implementation of a comprehensive suite of tools to prevent and manage sediment loss.
 2. Being proactive in assisting builders and developers to understand and fulfil their obligations.
 3. Responding to community concerns.
 4. Investment in infrastructure to capture sediment.



Comprehensive regulatory framework intended to decrease sedimentation caused by urban development



Our success factors for preventing and managing sediment loss from building, subdivision and construction sites:

Sedimentation resulting from urban development a continuing concern.

Most urban development within the City disturbs the natural environment and this, in combination with the



A preventative and proactive best practice approach to controlling sand drift and dust from subdivision, building and construction sites



Our success factors for preventing and managing sediment loss from building, subdivision and construction sites

80% of building sites in the City of Cockburn are estimated to be compliant with the City's local law for dust control from subdivision and building sites. This is due to:

1. A preventative and proactive approach during the planning phase of subdivision and construction.

A successful initiative to combat sand drift/dust from building sites: Voluntary hydro-mulching of vacant blocks at a North Coogee subdivision

In order to prevent and minimise the impact of sand drift and dust on the surrounding community and to prevent nuisance for neighbouring residents, the City of Cockburn implemented a voluntary hydro-mulching program.



Managing urban development to protect our local waterways



The extent of the problem

The Shire of Augusta Margaret River is well aware that construction work and ground disturbing activities can result in the transportation of sediments or pollutants from the land into receiving waterbodies or watercourses.

The Shire has experienced ongoing sediment and erosion issues at local construction sites, particularly where sites are steeply sloping, have been stripped of vegetation and have impermeable soils.

Improvements to our existing management regime

For several years the Shire has been investigating ways to better manage sediment and erosion control on



Working hard to facilitate cooperation from builders and developers



Our success factors for preventing and managing sediment loss from building, subdivision and construction sites

The City of Bayswater estimates about 80% of building, subdivision and construction sites in the City are compliant with State Government legislation and the City's local laws in regard to the management of soil erosion, sediment runoff, sand drift and dust. This is due to:

1. The City effectively engaging with developers and builders at the planning phase of subdivision, commercial and residential building applications.
2. The City maintaining a strong commitment to monitoring sites to ensure compliance with State Government legislation and our local law.

A simple targeted approach at the outset works best

The City of Bayswater requires the applicant to submit a dust management plan or construction management plan during the planning assessment and referrals stage. In most cases, the applicant will engage environmental consultants to look at the process and recommend the control measures needed to prevent this issue at subdivision approval stage.

Education and support for builders and developers is important



Practical solutions to prevent and address sedimentation from urban development



Success factors for preventing and managing sediment loss

Eighty per cent of building sites in the City of Subiaco are estimated to be compliant with the City's regulations and conditions for preventing and managing soil erosion, surface run-off, sand drift and dust. This is due to:

1. The development of guidelines and protection bonds to prevent sedimentation resulting from urban development.

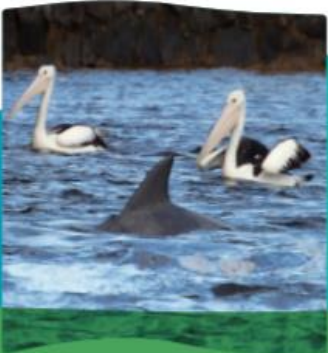
A Gross Pollutant Trap tackles 12 tonnes of sediment annually

In 2017, the City of Subiaco was forced to undertake a clean-up of Mabel Talbot Lake in Jolimont. Sediment forming at the bottom of the lake was threatening the health of the lake and impeding water flow. Seven tonnes of sediment was removed from the lake during this manual clean-up, at a cost of over \$36,000.

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SEDIMENT TASK FORCE RESOURCES FOR LOCAL GOVERNMENTS IN WA

TAKING ACTION TO CONTROL SEDIMENT



SIMPLE SOLUTIONS
TO PROTECT THE HEALTH OF
PERTH'S WATERWAYS

Regulation for Effective Sediment Management

InfoSheet for Local Government



Pollutants such as soil, sand and cement can be blown or washed away from building and construction sites. Appropriate erosion controls should be used on road work sites and residential, commercial and industrial developments. When appropriate erosion controls are not used, soil, sand and cement travels through the stormwater drainage system and can pollute local parks and sensitive environments such as rivers, wetlands and oceans.

Sediment discharge as described above is not regulated by the State Government. Local Government has the opportunity to regulate sediment management through local laws which can address this issue that affects infrastructure, the local community and the environment.

Local Government plays an Important Role

Together with builders, residents and environmental managers, Local Governments are working to control sediment to:

- Reduce the risk of houses and roads flooding as a result of blocked stormwater drains;
- Reduce the risks of accidents on roads and paths;
- Prevent sediment from covering grass in parks that receive stormwater runoff;
- Help to maintain stormwater management systems such as biofilters, pervious paving, infiltration cells and tree pits that are critical to protecting our rivers, wetlands, marshlands and oceans;
- Protect hydrological functions of rivers, wetlands and other waterways;
- Prevent sediment from smothering the reeds, plants and seagrasses that keep our rivers, wetlands and oceans healthy;
- Ensure river pools continue to provide a vital refuge for fauna during long hot summers and dry seasons;
- Protect aquatic invertebrates and benthic algae populations, whose presence is necessary for water ways to remain healthy ecosystems;

Local Government can expend large amounts of time and money on:

- sweeping roads;
- repairing and maintaining stormwater management systems;
- responding to public complaints; and
- remediating or restoring rivers, wetlands and parks.

Drains are Just for Rain

In addition to enacting local laws to effectively manage sedimentation, Local Governments can:

- Issue sediment control advice with building approvals;
- Include sediment control in compliance action;
- Include planning approval conditions or advice notes requiring developers to control, mitigate and regularly sweep sediment drifts; and
- Manage public works to ensure best sediment control practice.

We all Benefit

Success in sediment control will:



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Sediment Task Force Members



Why control sediment



Research Initiatives



Resources: Sediment Management



STF Local Government Survey Results



Local Government Case Studies



Local Government Tool for Sediment Management



On-Site Builders Checklist for Preventing Sediment



<https://www.perthnrm.com/programs/living-landscapes/sediment-management>



Living Landscapes and Living Perth are initiatives of Perth NRM, a non-profit entity

Thank you for your interest.



Department of Biodiversity,
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SWAN CANNING
RIVERPARK