Stormwater Impact Assessments
Connecting primary, secondary and cumulative impacts to Hawaii’s Environmental Review Process

TRAINING
June 3, 2013
West Hawaii Civic Center

Presented by

Agenda
1:00 – 1:10 Introductions
1:10 – 1:15 Background
1:15 – 1:20 Introduction of Five-Step Framework
1:20 – 1:30 Step 1: Gather pertinent data
1:30 – 2:15 Step 2: Determine appropriate level of analysis
2:15 – 2:25 BREAK
2:25 – 2:55 Step 3: Analyze data in light of proposed project
2:55 – 3:20 Step 4: Identify mitigation goals & measures
3:20 – 3:25 BREAK
3:25 – 3:35 Step 5: Summarize impacts and mitigation measures
3:35 – 3:45 Review checklist – Exercise
3:45 – 4:00 Conclusion & Questions

Background

• Guidance document purpose & need

“Cumulative effects assessment is neither well understood nor well implemented and is not integrated with the planning process”
(University of Hawai’i, 2010)
Question 1

Goal:
Improve how Environmental Impact Statements (EISs) and Environmental Assessments (EAs) address stormwater impacts in Hawaii

Principles
- Clarifying how stormwater impact assessment relates to the environmental review process
- Acknowledging how stormwater characteristics in Hawaii’s varied environments may differ from mainland conditions
- Incorporating Best Management Practices and creative offsite practices as mitigation measures that can be translated to permit conditions
Primary & Secondary Impacts

Primary (Direct)
- Occur at same time & place as cause
- Effects on project site
- Pertinent factors:
  - bare soil
  - impervious surface
  - nutrient load
  - peak flow

Secondary
- Occur later in time or removed in distance but reasonably foreseeable
- Offsite and down gradient from project
- Examples:
  - growth-inducing effects
  - ↑ sediment in down stream water body

Cumulative Impacts
- Results from incremental impact of the action when added to past, present, and reasonably foreseeable future actions
- Occurs within boundaries of a watershed
Question 2

Relationship to State Planning Policies

- Hawaii State Plan Goal (HRS § 226-4 (2))
- Hawaii State Plan Priority Guideline (HRS § 226-109)
- Federal Coastal Zone Management Act (HRS § 205A-2)
- Significance Criteria (HAR § 11-200-12)

Five-Step Framework

1. Gather pertinent data
2. Determine appropriate level of analysis
3. Analyze background information in light of proposed project
4. Identify mitigation goals & propose mitigation concepts
5. Summarize impacts & mitigation
Where does this framework fit in to the EIS process?

Five-Step Framework

1. Gather pertinent data
2. Determine appropriate level of analysis
3. Analyze background information in light of proposed project
4. Identify mitigation goals & propose mitigation concepts
5. Summarize impacts & mitigation

Step 1: Gather pertinent data

Objective: Collect & document pertinent data about existing site & watershed conditions

Methodology: Use best available data and early consultation to document site and watershed hydrology, stressors and sensitivity. Document anticipated stormwater permit requirements as well as management programs that pertain to site and watershed resources.
Step 1: Gather pertinent data

“How much and where does the water flow?” (hydrology)

“What are the potential sources of water pollutants?” (“stressors”)

“How resilient are the down gradient resources to pollutants?” (“sensitivity”)
What are the potential sources of water pollutants?

Site scale? Watershed scale?

How resilient are the down gradient resources to pollutants?

Site scale? Watershed scale?

Hawaii County Grading Permits

Hawaii County Code Chapter 10

- Exclusions to permit (HCC §10-3)
- Erosion & sediment control measures (HCC §10-18→10-23)
  - Height
  - Cut slopes
  - Fill slopes
  - Distance from property line
  - Area opened
  - Fill material
  - Preparation of ground surface
  - Placement & compaction
  - Vegetation
  - Drainage provisions
Exclusions to Permit
HCC §10-3
• Mining or quarrying operations
• Basements, footings, etc. of building authorized by valid permit
• Individual cemetery plots
• Sanitary filling and operation of dumps
• Exploratory excavations < 50 yd³

Exclusions to Permit
HCC §10-3
• Agricultural operations in conformance with soil conservation practices and in accordance with an actively pursued comprehensive conservation program
• Trenching & backfilling for utility and drainage conduits
• Clearing, excavation, and filling req’d for installation of pole lines

Limited Exclusion to Permit
HCC §10-3(6) & (7)
• Excavation or fill < 100 yd³ and < 5 ft. vertical height at its highest/deepest point
  – Must follow cut slopes/fill slopes and distance to property line requirements
EXERCISE – STEP 1

Kona Site X

Site = 336 acres  Watershed = 9,545 acres

Kona Site X
Kona Site X

- Business park
- Industrial development
- Quarry (for 20 more years)
- Three Phases
  2002-2020

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Step 1 – Hydrology

*How much & where does the water flow?*

Existing land use/cover:

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Proposed Land Uses in Region

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Step 1 – Hydrology
How much & where does the water flow?

Soil type:

Drainage pattern:

Wetlands or embayments?

Receiving waterbodies:
**Step 1 – Hydrology**  
*How much & where does the water flow?*

**Slope & topography:**
- Gently sloping
- 40 feet above sea level to 320 feet at mauka border

**Flooding hazard:**
- FIRM Zone X
- Community flood insurance study – moderate or minimal hazard

**Annual rainfall and seasonal distribution:**
- 15-20 inches per year
- 1.63 inches per hour for 10-year storm
- 2.02 inches per hour for 50-year storm
- Mostly during winter storm season

**Evapotranspiration & interception:**
**Step 1 – Hydrology**

*How much & where does the water flow?*

- **State LUD:** Conservation
- **County General Plan:** Industrial & Urban Expansion
- **Zoning:** Open
- **Aquifer:** Thin, brackish, slow moving basal lens in contact with saline water
- **Existing infrastructure:** None

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**Step 1 – Stressors**

*What are the potential sources of water pollutants?*

- **303(d) waterbodies:** No.
- **Waterbody classification:**
  - Inland waters - Class 2
  - Marine waters – Class AA

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**Step 1 – Sensitivity**

*How resilient are down gradient resources to pollutants?*

- **Potentially impacted resources:**
  - Aquatic?
  - Riparian?
  - Cultural?
  - Recreational?
  - Ag demand?
  - Aquifer?
Step 1 – Sensitivity
How resilient are down gradient resources to pollutants?

Management considerations:
- Marine Reserves or MPAs?
- State WQ standards?
- NPDES Permit?
- Presence of Threatened or Endangered species? (consider site and watershed)

Step 2: Determine appropriate level of analysis

Objective: Determine what level of analysis is sufficient to give stormwater concerns appropriate consideration in the planning phase.

Methodology: Stormwater volume generated on site. Does the stressors + sensitivity + intensity = need for an estimate of volume of pollutants?
Where does this step fit in?

Analysis Considerations

Watershed impairment/stressors
Watershed sensitivity
Development intensity

EXERCISE – STEP 2
Step 2 – Watershed Impairment/Stressors

Has a TMDL been established for any stream segment in the sub-watershed or for the receiving waterbody?

Is there an impaired stream or waterbody in the sub-watershed that is classified as category 5 under §303(d) of the Clean Water Act?

Step 2 – Watershed Impairment/Stressors

Is there an impaired stream or waterbody in the sub-watershed that is classified as category 4a, 4b, 4c, or 3 under §303(d) of the Clean Water Act?

Step 2 – Watershed Sensitivity

Is the receiving waterbody:
• Designated Class 1 or Class AA?
• Subject to Hawaiʻi’s Local Action Strategy to Address Land Based Pollution Threats to Coral Reefs?
• Identified as sensitive on Hawaiʻi Watershed Priority Project?
Step 2 – Watershed Sensitivity

Do site conditions or combination of site conditions lend themselves to excessive runoff?

Step 2 – Development Intensity

Is the site located in a small urban watershed or sub-watershed (measuring no more than 1 square mile in area and anywhere between 25% and 100% impervious surfaces)?

Step 2 – Development Intensity

Is the action subject to an NPDES permit?

Is LEED® certification desired?

Is the action subject to a County Grading, Grubbing, Tree removal or Erosion and Sediment Control Permit?
Step 2 – Summary

- Sufficient to prepare for applicable NPDES and grading req’s
- Using existing data and knowledge of the proposed action, document possible pollutant inputs. If potential pollutants inputs are expected to directly impact Class I or Class AA waters, consider an analysis that estimates the pre- and post-development runoff volume and volume of pollutants in the runoff pre- and post-development.

Five-Step Framework

1. Gather pertinent data
2. Determine appropriate level of analysis
3. **Analyze background information in light of proposed project**
4. Identify mitigation goals & propose mitigation concepts
5. Summarize impacts & mitigation

Step 3: Analyze background information in light of the proposed action

3a. Analyze primary (direct) impacts at the project scale
3b. Secondary impacts (offsite, down gradient)
3c. Cumulative impacts
Where does this step fit in?

Step 3a: Primary impacts

Objective: Discuss impacts & proposed mitigation during construction.
Discuss anticipated direct impacts from the proposed action

Step 3a: Primary impacts

- Construction impacts
  - NPDES permit?
  - Grading permit?
- Pre- vs. Post-development
- Long-term impacts

Image source: www.bluewaterbaltimore.org
Step 3b: Secondary impacts

**Objective:** The analysis of secondary impacts should assess:
- Potential for down gradient flooding
- Impacts to down gradient sensitive resources

Step 3c: Cumulative impacts

**Objective:** The analysis of cumulative impacts should assess the impacts on sensitive resources from all parts of the watershed relative to existing conditions and potential buildout.

**Methodology:** Minimum planning-level assessment
- Assess existing status of sensitive resources
  - Discuss past actions
  - Discuss present actions
  - Discuss reasonably foreseeable future impacts
Step 3c: Cumulative impacts

**Methodology:** Small, urban watershed assessment

- Assess existing buildout relative to potential buildout
  - Existing impervious area
  - State LUD “Urban” as indicator of future imperviousness

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Step 3c: Cumulative impacts

**Methodology:** Watershed modeling for unique circumstances

- Necessity determined in Step 2
- Review for appropriate calculations and summarized results

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Question 3
EXERCISE – STEP 3

Five-Step Framework
1. Gather pertinent data
2. Determine appropriate level of analysis
3. Analyze background information in light of proposed project
4. **Identify mitigation goals & propose mitigation concepts**
5. Summarize impacts & mitigation

Step 4: Identify mitigation goals & propose mitigation strategies

**Objective:** Integrate the primary, secondary, and cumulative impacts to determine the desired extent of mitigation, while considering site and watershed conditions to formulate mitigation strategies.
Where does this step fit in?

- Gather Relevant Data
- Determine Appropriate Level of Analysis
- Analyze Background Data in Light of the Proposed Project
- Identify Mitigation Goals & Propose Mitigation Strategies
- Summarize Impacts and Mitigation

PROJECT SCORING/ PRE-CONSULTATION OR ESPN
DRAFT EA, EIS
FINAL EA, EIS

Identify mitigation goals

- Robust enough to support a FONSI
- Anticipate required permits
- Acknowledge role of engineering in design development

*Clear in concept, but not overly prescriptive!*

Mitigation performance criteria

- Maximum extent practicable
- Best available technology
- Range of outcomes
<table>
<thead>
<tr>
<th>Potential Impacts</th>
<th>Level of Desired Resource Avoidance/Protection (Goal)</th>
<th>Mitigation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polluted runoff</td>
<td>No unnecessary pollution should occur</td>
<td>Use BMPs to control polluted runoff to MEP</td>
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</tbody>
</table>

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<th>Mitigation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific pollutant identified as concern in watershed may be found in site runoff</td>
<td>No increase to pollutant of concern</td>
<td>BMPs tailored to address the pollutant of concern to MEP</td>
</tr>
</tbody>
</table>

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<th>Level of Desired Resource Avoidance/Protection (Goals)</th>
<th>Mitigation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polluted runoff throughout the watershed</td>
<td>No increase cumulatively</td>
<td>Contribute to off-site mitigation</td>
</tr>
</tbody>
</table>
Mitigation Phases

- **Design Phase**
  - Site planner
  - Plan or Site Approval; Grading Permit; Building Permit

- **Construction Phase**
  - Contractor
  - NPDES or Grading Permit

- **Operational Phase**
  - Owner & Successors

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Question 4

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BMP Strategy Considerations

- Low Impact Development Concepts
- LEED® Standards
- Innovative
- Permanent vs. Temporary
EXERCISE – STEP 4

Five-Step Framework
1. Gather pertinent data
2. Determine appropriate level of analysis
3. Analyze background information in light of proposed project
4. Identify mitigation goals & propose mitigation concepts
5. Summarize impacts & mitigation

Step 5: Summarize impacts & mitigation applicable to project

Objective: Documentation of impacts, mitigation measures and their projected results.

Methodology: The Draft EA or EIS should summarize all anticipated impacts as described in HAR §200-11(I.) as well as proposed mitigation strategy as described in HAR §200-11(M.)
Where does this step fit in?

1. Gather Pertinent Data
2. Determine Appropriate Level of Analysis
3. Analyze Background Data in light of the Proposed Project
4. Identify Mitigation Goals & Propose Mitigation Strategies
5. Summarize Impacts and Mitigation

Reviewer’s Checklist Exercise

- Using the Reviewer’s Checklist in Appendix C, analyze the provided example for completeness.

Thank you!

Time for questions or comments

MAHALO!