

ADVICE FOR URBAN CLEAN-UP OPERATIONS

VOLCANIC ASH IS: HARD, HIGHLY ABRASIVE, MILDLY CORROSIVE AND CONDUCTIVE WHEN WET.

ASH CLEAN-UP FROM URBAN AREAS & CLEAN-UP METHODS

- Prompt clean-up of urban areas is essential to minimise damage and disruption
- Ashfalls of only a few mm depth will generate large volumes of ash for collection and disposal

EFFECT OF ASH CHARACTERISTICS

- Some ashes may 'cement' over time, especially if saturated and then dried
- Fine grained ash (<0.5 mm particle size) readily remobilises, so may require a binding agent
 - » For more information: <http://volcanoes.usgs.gov/ash/remove.html>
- Coarse ash (>1 mm) is less easily-remobilised, but may be crushed when driven on or moved
- Some ashes are extremely abrasive and can cause greatly accelerated wear on equipment. Refer to 'Advice for Roving Managers' poster

| ASHFALL DEPTH | TYPICAL IMPACTS IF NOT CLEANED UP | SCALE OF CLEAN-UP |
|---------------|--|---|
| <0.5 mm | Minimal | • Usually no action required |
| 0.5-2 mm | • Minor traffic hazards due to covering of road markings and loss of traction. | Minor clean-up <ul style="list-style-type: none">• Sweeping of roads, paved areas, and roofs/gutters usually sufficient. |
| 2-30mm | • Significant traffic hazards <ul style="list-style-type: none">• Gutter collapse/blockage• Ash may block storm drains• Risk of severe damage to wastewater treatment plants (WWTPs) if ash enters sewer lines | Moderate clean-up <ul style="list-style-type: none">• All roads and paved areas on public and private properties require cleaning;• Private properties require assistance with clean-up• Need for coordination of clean-up• Ash dump(s) established. |
| >30 mm | • Severe traffic hazards <ul style="list-style-type: none">• Blockage of storm drains and/or sewers, leading to surface flooding• High risk of severe damage to WWTPs if ash enters sewers | Major clean-up <ul style="list-style-type: none">• As above, but with significantly larger volumes which will require greater resources and/or cleaning time;• Vegetated areas (e.g. parks and gardens) may require cleaning too; |

ASH CLEAN-UP GUIDE



RECOMMENDED ACTIONS

WHERE TO FIND WARNING INFORMATION

See www.geonet.org.nz for ashfall forecasts in the event of an explosive eruption.

HOW TO PREPARE

- Further guidance on ash clean up and disposal is available from:
 - » http://www.aelg.org.nz/volcanic-impacts/visg_home.cfm
 - » <http://volcanoes.usgs.gov/ash/remove.html>

Areas exposed to ash hazards should have plans in place beforehand covering the following aspects:

- **Personnel and equipment requirements.** Include mutual support agreements for ash clean-up as part of regional contingency planning
- **An incident management system/database** to manage the clean-up operation
- **Identification of potential disposal sites** on a regional basis as part of contingency-planning
- **Strategies for stabilisation of deposits**

Spontaneous volunteerism: Volunteer labour can significantly speed clean-up operations, but requires effective management and integration with professional crews

- The following may help: regular briefings, liaison officers, provision of appropriate equipment and health and safety support

HOW TO RESPOND

Avoid cleanup until ash has stopped falling where possible.

- Clear and ongoing communication with the public during clean-up operations aids efficiency, public trust and goodwill

Coordination

- Prioritize clean-up (i.e. arterial routes, key facilities, etc.)
- Avoiding or limiting ash ingress into storm-water networks is a key consideration
 - » Wet clean up methods should only be used where storm-water drains have been isolated.
- A coordinated clean-up of neighbourhoods will optimise use resources and reduce recontamination of cleaned sections

Machinery may need additional maintenance in the ashy conditions. See companion poster **Advice for Roving Managers** for recommended advice (http://www.aelg.org.nz/volcanic-impacts/visg_home.cfm)

Health and Safety

- Workers and volunteers involved in clean-up operations can be exposed to high concentrations of airborne ash particles
 - » See www.ivhnn.org for more information on Personal Protective Equipment guidance
- Advise extreme caution as many injuries and some fatalities have occurred during ash clean-up operations, particularly due to falls from roofs or ladders.

MORE INFORMATION

THE FOLLOWING RESOURCES PROVIDE FURTHER INFORMATION ON VOLCANIC HAZARDS:

<http://www.geonet.org.nz>
<http://www.gns.cri.nz>
<http://volcanoes.usgs.gov/ash/index.html>
<http://www.ivhnn.org>

DRAFTED BY TOM WILSON, CAROL STEWART AND MARLENE VILLEMURE.

20 September 2013