

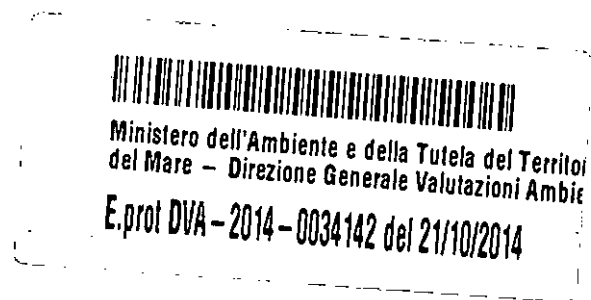
## Pec Direzione

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**Da:** francesco.damosto@postacertificata.gov.it  
**Inviato:** venerdì 17 ottobre 2014 23:37  
**A:** DGSalvanguardia.Ambientale@PEC.minambiente.it  
**Oggetto:** Osservazioni VIA Scavo Canale Contorta Venezia  
**Allegati:** observations\_wahv TS JDM.pdf; observations\_wahv TS JDM.pdf; observations\_wahv TS JDM.pdf

in allegato le osservazioni al progetto dello scavo Canale Contorta (Venezia) proposta dall'Aurita Portuale, da parte del We Are Here Venice e Dr Tom Spencer, Direttore, Cambridge Coastal Research Unit, Dept of Geography, University of Cambridge.

A breve ingremeremo ulteriori osservazioni e studi internazionali al riguardo Grazie dell'attenzione



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**RE: OBSERVATIONS REGARDING THE CURRENT ENVIRONMENTAL IMPACT ASSESSMENT OF THE PLAN ID\_VIP 2842 PRESENTED BY THE VENICE PORT AUTHORITY REGARDING THE DREDGING OF THE CONTORTA-SANT'ANGELO CANAL AND DEPOSITED WITH THE MINISTRY FOR THE ENVIRONMENT**

Venice, 17 October 2014

Herewith some notes outlining our deep concerns regarding the Venice Port Authority's plan to dredge a new navigation channel in the Lagoon. Due to severe time restrictions and for organisational reasons, we have not been able to fully explain our observations, also in the light of current scientific literature. We will provide more complete analyses, and thank you in advance for your understanding and patience.

**Please advise if an Italian translation is required.**

## INTRODUCTION

The project “Reshaping of the transit route to the Venice Cruise Passenger Terminal and the reconditioning of areas near the Contorta Sant’Angelo Canal”, presented by the Venice Port Authority for Environmental Impact Assessment on 17 September 2014, will be referred to here as the *Contorta Plan*.

Submission of these observations *must not* be interpreted in any way as acceptance of the legitimacy of the Venice Port Authority (APV) to apply for approval, and funding, within the provisions of the Objective Law 443/2001 for Strategic Infrastructure in an area that is *inter alia* outside the bounds of the Port Regulatory Plan. The Environment Ministry has already been made aware of the various appeals issued against the approval process for the Contorta Plan, together with ongoing calls for a Strategic Assessment of all possible alternatives to large cruiseships transiting close to St Mark’s and along the Giudecca Canal, into the heart of the city where the Passenger Terminal is currently located.

An unreasonably compressed timespan for public consultation, resulting from the Port’s positioning of the application under the Objective Law, represents *a lost opportunity for gaining valuable insight* into critical aspects of the plan, many of which do not appear to have been considered in the Environmental Impact Study accompanying the Contorta Plan.

The scarce amount of time available has reduced our “observations” to being provided on the basis of the following:

- Examination of the 113pg Non Technical Summary (49.810.000 04b).
- Exploration of specific areas in various sections of the main Study, via the Environment Ministry website (<http://www.va.minambiente.it/it-IT/Oggetti/Documentazione/1486/2259>).
- Consultation with sources of local expertise and internationally recognised scientists, together with a review of relevant scientific literature.
- Combination of the above with 20 years’ experience as “knowledge brokers” on critical subjects affecting the state of Venice and future prospects, including coordination of the 5 year study supported by the Venice in Peril Fund “Flooding and Environmental Challenges for Venice: State of Knowledge” (Cambridge University Press, 2006) and the 3 year study of tourism, use of buildings, demography and public finance that was crystallised in “The Venice Report” (2009), as a consultant on Water Affairs for the 2010 OECD Venice Territorial Review.

## A CONTEXT OF THE CONTORTA PLAN

### *A weak reference framework – both institutional and conceptual*

For Venice, especially, it is essential to articulate *target conditions* since the system is entirely reliant on human intervention, of one kind or another, for the maintenance of its functionality and morphology. Yet observations prepared by local experts (many of whom have submitted their reports directly to this EIA process), plus related discussions, have signalled contradictions in, and/or a total absence of, *reference parameters* against which to measure the impacts or evaluate changes in the Lagoon system.

Throughout time, the Venice Lagoon has been influenced by humans; there is no reference, pristine state that can be identified in the way that might be possible for an old growth forest. This form of coexistence allows such a typically “transitional environment” to continue to exist as a unique city with a very particular lagoon ecology and biodiversity.

The recent success of the “Venezia è Laguna” awareness-raising campaign, conceived by We are here Venice, is testament to the prevailing and broad understanding of the inseparability of the fate of the historic centre of Venice and the state of the surrounding Lagoon (see Appendix 1) and their strong interdependence.

Large-scale infrastructural works have a long history in the Venice lagoon. Half a millennium ago the main rivers were re-routed to prevent the lagoon from silting up completely. At the beginning of this millennium, we saw the beginning of the construction of the mobile barriers to allow the lagoon to be cut off from sea temporarily to protect the built environment from extreme flooding. These interventions, as well as many others in the intervening period, preserve the *functionality* of the lagoon system.

However, acknowledging that human intervention in the lagoon has always been necessary also to protect, maintain and even enhance the physical and physiological matrix for the historical, cultural, social, economic, environmental etc. survival of Venice (Caniato G., Between salt and freshwaters, in *Flooding and Environmental Challenges for Venice*, Spencer and Fletcher (Eds), CUP, 2006) comes conceptually very close to the potentially self-destructive position of losing sight of *the limits to human-induced changes* to lagoon dynamics (directly and indirectly as a consequence of uncontrolled activities like boat traffic, infrastructural changes like channel dredging, inadequate maintenance of natural features like saltmarsh protection).

The current situation in the lagoon is widely agreed to be close, in some key geographical areas, to the complete loss of essential processes and features that maintain the resilience of the system (D’Alpaos L., *Fatti e Misfatti di Idraulica Lagunare*, IVSLA, Venezia 2010). Any loss of such processes and features will also lead to the loss of a range of ‘ecosystem services’ provided by the lagoon, not only within the lagoon itself but also to the city population and beyond.

*Deep dredging and straightening another channel for shipping cannot be conceived as just another change to an already highly “anthropicized” environment, the negative impacts of which can be overcome by other engineered interventions. Instead the Contorta Plan needs to be recognised as a major disturbance to a system in which the interactions between the engineered features and natural dynamics on which the survival of Venice depends are already disintegrating. It is even possible that this intervention may lead to the lagoon crossing a ‘tipping point’ into an irreversible alternative state, that of a fully marine embayment.*

*It is not difficult to imagine an accelerating net loss of sediments from the lagoon system (Saretta A. et al, *Sediment budget in the Lagoon of Venice, Italy, Continental Shelf Research* 30 (2010) 934–949; Molinaroli E. et al, *Thirty-year changes (1970 to 2000) in bathymetry and sediment texture recorded in the Lagoon of Venice sub-basins, Italy, Marine Geology* 258 (2009) 115–125)); further erosion and*

*breakdown of typical morphological features like saltmarsh, tidal flats and meandering tidal channels which affect current flows and contribute to negative feedback cycles in terms of sediment dynamics, and increasing populations of fish and bird species associated more with marine environments and less with coastal lagoon systems.* In addition to lagoon monitoring programmes the descriptions of fishermen and naturalists provide valuable insight, starting with the capture of a 55kg tuna in the northern Lagoon in 2012 (personal communication) and the sharp rise in cormorants who benefit from greater fishing opportunities in deeper and more transparent lagoon waters (Atlante degli uccelli nidificanti e svernanti della provincia di Venezia, ed Associazione Faunisti Veneti & Fondazione Musei Civici di Venezia - Museo di Storia Naturale, Venezia, 2014).

Despite challenges to the sustainability of the Venice Lagoon system and the considerable volume of resources (intellectual and financial; local, national, European and global) dedicated to safeguarding Venice and the Lagoon:

- There is (still) no long term, integrated management strategy for the lagoon and its environs.
- Institutional and governance gaps and conflicts persist, exacerbated especially by the recent suspension of the Magistrato alle Acque, ongoing corruption-related investigations, and the lack of a democratically representative local government.

The ambiguity surrounding the Morphological Plan for the Lagoon (lengthy gestation and continuing delay in the approval and adoption stages), as reported in the media, is evidence of these shortcomings.

*Confusion between general aims for protecting the lagoon and specific economically-motivated choices that may, or may not, be amenable to mitigation measures*

In line with the above, we have found an underlying conceptual flaw in the APV approach that mixes the generalised urgent need to address the advanced state of environmental degradation, especially in certain areas of the Lagoon that would fall within the Contorta Plan, and the purely economically driven choice relating to dredging another channel for cruiseships – the impacts of which may, or may not, be mitigated via “morphological reconstruction”.

There has already been a very strong public reaction against the Contorta Plan, evidenced by the broad success of the petitions – both online (nearly 30,000 signatures via change.org <http://www.change.org/p/matteo-renzi-fermate-lo-scavo-del-maxi-canale-contorta-prima-che-sia-troppo-tardi> ) and on the ground (approaching 5,000 signatures at booths and in shops in Venice and Mestre).

Significant further background research is necessary to responsibly address the issues raised by the Preliminary Study (including searching of existing environmental archives and putting data into a common format).

Our review has mainly focused on examining where and what evidence has been found to support the choice of the Contorta Plan, and on weighing the associated uncertainties and critical aspects.

## B UNCERTAINTIES & CERTAINTIES

### *Hydrodynamics and Morphology*

Trade-off between minimizing hydrodynamic effects by enclosing the new navigation channel and allowing for a broader channel within which the wave action is more attenuated and less of an erosive force... While enclosure within a training wall will prevent sediments eroded from within the channel from being deposited in the lagoon this leads to high currents and greater sediment export from the lagoon. The canal walls or similar structures, meanwhile, depending on hydrodynamics, could obstruct circulation and cause extended residence times, anoxia and other types of negative impact.

These aspects are not dealt with in anything like enough detail in the APV Study but we can make significant inferences from the following:

1. Observed changes along Canale dei Petroli  
Together with research reports, there is such evident erosion that is causing the disappearance of tracts of the Casse di Colmata at a rate of tens of centimetres per year, according to eyewitness reports from kayaking enthusiasts who regularly visit the area (Facebook Group *Venezia e la Laguna vista dall'acqua*). They also describe anomalous current fields and velocities (Stefano Barzizza, personal communication)
2. Depression wave effects in navigation channels can produce extremely strong waves, in line with the relationship between the ships breadth, underwater, and channel width as described in the suggested literature and direct observations
  - a. Rapaglia J et al, Characteristics of ships' depression waves and associated sediment resuspension in Venice Lagoon, Italy, *Journal of Marine Systems* 85 (2011) 45–56
  - b. Gelinas, M et al, Sediment resuspension by ship wakes in the Venice Lagoon. *Journal of Coastal Research, Coconut Creek (Florida)*, ISSN 0749-0208
  - c. Fort Lauderdale, San Giorgio Maggiore youtube
3. Continuous requirements for Operation and Maintenance dredging in circumstances comparable with the Venice Lagoon are described exhaustively for Galveston Bay. The benefit of this case study is the long time series data (100 years) and the evident exasperation in the face of extensive shoaling with costly consequences for channel infrastructure maintenance. (Rosati J et al, The mystery of historical channel shoaling at Houston-Galveston navigation channel, TX, US  
[http://www.worldscientific.com/doi/abs/10.1142/9789814355537\\_0043?queryID=%24%7BresultBean.queryID%7D&](http://www.worldscientific.com/doi/abs/10.1142/9789814355537_0043?queryID=%24%7BresultBean.queryID%7D&))

Morphological effects on a larger scale than the immediate area of the new channel, and the mitigation potential of proposed landfills along the edge of the new ship channel merit further examination and greater clarification than descriptions found in the Contorta Plan.

Regarding pure hydrodynamics, changes are expected in residence times, tidal flows, circulation patterns in the area between Fusina and the bridges connecting Venice to mainland especially as well as in the Giudecca Canal and some inner canals of northern Venice. A possible northerly shift of "partiacque" between the circulation sub-basins of Lido and Malamocco also needs to be investigated further, and carefully monitored, not least because of water quality implications in the inner canals and the risk of another episode of mass fish deaths due to anoxia (Summer 2013).

### Morphological reconstruction and Ecosystem Services

Rich literature (Spencer K. and Harvey G., Understanding system disturbance and ecosystem services in restored saltmarshes: Integrating physical and biogeochemical processes, *Estuarine, Coastal and Shelf Science* 106 (2012) 23e32; research on US east coast *Spartina* marshes and in the Netherlands via the Delta Plan) as well as observed characteristics of the reconstructed "saltmarsh" in the Venice Lagoon managed by CVN/MAV shows that what you get as artificial saltmarsh is very different from natural saltmarsh that you had before. Yet it is the very specific species composition and physical properties of naturally occurring saltmarsh that determine the ecological characteristics – including self regulating and regeneration – and, with that, the health of the Lagoon (Bonometto L, *The Thin Borderline*, Villa Frankenstein2, Journal of the British Pavilion – XII Venice Architecture Biennale, Cornerstone Press, 2010)

Stability issues of artificial landfills in their various forms, depending on height relative to average water level determines the feasibility and sustainability of man made structures introduced into a dynamic lagoon environment. Research has shown that outside a specific range, tidal flats will have a tendency either to erode or grow too high relative to average water level to exert the influence on hydrodynamics that was originally planned.

(Marani, M. et al, Biologically-controlled multiple equilibria of tidal landforms and the fate of the Venice lagoon, *Geophys. Res. Lett.*, 34, L11402, doi:10.1029/2007GL030178, 2007.

A. Defina et al, Self-organization of shallow basins in tidal flats and salt marshes, *J. of Geophysical Research, Earth Surface*, 112, F03001, doi:10.1029/2006JF000550, 2007.)

### Maritime Traffic

The Contorta Plan does not provide much information on how different kinds of traffic will be managed in the Canale dei Petroli. For safety reasons, commercial and industrial traffic cannot mix with passenger traffic (cruiseships as well as the ferries since the ferry terminal was recently relocated from San Basilio to Fusina).

The current President of APV has stressed in academic meetings (IVSLA, Study Commission Conference, Porto di Venezia: problem e prospettive, 13/10/2013

[https://www.youtube.com/watch?v=XZ1G38WFAGs&feature=youtube\\_gdata\\_player](https://www.youtube.com/watch?v=XZ1G38WFAGs&feature=youtube_gdata_player)) as well as in public meetings (Municipalità di Venezia, Sala San Leonardo, presentation of Contorta Plan, 3/10/2014) that the strategic objective of APV is to grow the commercial (container based) side of the business.

### Economic aspects

The APV plan contains very little strategic – baseline – information on the cruise industry's direct and indirect costs and benefits for Venice, the Veneto and Adriatic Region – as well as it's relative importance within the scheme of overall Port activities). This needs to be explicitly addressed to assess the cost effectiveness of major dredging operations (as well as moving several pipelines and other utilities that cross the lagoon in the Contorta area, considered in other sets of observations) to prolong the lifespan of the recently expanded Passenger Terminal at Tronchetto as well as to be able to consider the relative merits of alternative solutions for dealing with cruise traffic.

## C CONCLUSIONS FROM A STRATEGIC STANDPOINT

### Fundamental reservations regarding the proposal to dredge another channel

- Lack of hydrodynamic model validation and hence considerable, unquantified uncertainties regarding hydrodynamic impacts
- Too little detail on the specifics of 'morphological reconstruction' and hence considerable reservations about the effectiveness of morphological reconstruction to at least mitigate the impacts of another shipping channel, let alone restore ecosystem services in the Lagoon (as claimed by the Contorta Plan). The degree to which reconstructed wetlands, for example, can mimic natural wetland form and function, and hence supply the same level of ecosystem services, is not adequately addressed;
- Debilitated baseline conditions in the Venice Lagoon makes restoration of the system a greater priority, before consideration of a large infrastructure intervention that would risk moving beyond the so-called "tipping point" from a transitional to a fully marine environment;and
- Lack of a robust institutional framework to support the challenges and ongoing monitoring requirements of such a large change to the system(reference Morphological Plan, but who will do the ongoing monitoring)

### Precautionary principle and unexplored potential of alternative solutions that could be more permanent and cost-effective

Such a large intervention in the lagoon requires serious analysis with a long term perspective. It cannot be treated as a quick-fix interim measure, considering the potential implications of the changes to the Lagoon directly and the effects to Venice on a local, national, regional and Mediterranean scale on top of the global significance of this location (see next point)

### UNESCO Doha Resolution (June 2014)

The most recent meeting of the UNESCO World Heritage Commission expressed serious concern "about the extent and scale of proposals for large infrastructure, navigation and construction projects that can potentially damage the Outstanding Universal Value" of Venice and made a series of decisions that are much stronger than previous prescriptions (see Appendix 2), not least that ships must be taken OUT of the Lagoon as soon as possible.

[While the UNESCO officers are not as intimately informed of local issues, it is important and more continuous attention to the delicate Venice situation than offered by the fast changing political panorama and uncertain domestic institutional framework]

### Climate change scenario

Climate change, especially the rate of sea level rise, is barely considered in the Contorta Plan, and this unfortunately reflects the absence of a strategic approach also at the level of local government.

Sea level rise estimates from the IPCC Fifth Assessment Report (Church et al., 2013) suggest global mean sea level rise for 2081–2100 relative to 1986–2005 in the range:

26 to 55 cm (for the low emissions scenario RCP2.6)

medium range scenarios, 32 to 63 cm (for RCP4.5) and 33 to 63 cm (for RCP6)

high range scenario, 45 to 82 cm (for RCP8.5)



What are the current sea level scenarios envisaged by the Contorta Plan? How do these relate to these new estimates of sea level rise from the global scientific community?

How are these global level rise scenarios reflected in local sea level change in the Venice lagoon (i.e. how does the Plan see these scenarios being modified by local tectonic controls?)

What are the implications of these new figures for the likely pattern of MOSE closures and how will this changing pattern pattern of closure impact upon different types of traffic flows?

Supporting studies

Established centres of excellence, notably research groups at the University of Padua and CNR-ISMAR, together with their international networks, appear not to have contributed to the planning process, while a project of this level of complexity in such a delicate environment would benefit from the best available expertise.