

PARTNERSHIP FOR ACID DRAINAGE REMEDIATION IN EUROPE (PADRE): BUILDING A BETTER FUTURE FOUNDED ON RESEARCH AND BEST PRACTICE.¹

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Abstract. PADRE has been established as a permanent commission of the International Mine Water Association (IMWA), with the aim of fostering best practice, based on the latest research, in the remediation of acidic drainage from active and abandoned mine sites throughout Europe. PADRE activities include: maintaining best practice guidelines on passive remediation (the PIRAMID Guidelines) and catchment-scale mine water management (the ERMITE Guidelines); developing further sources of guidance; implementing training and professional development activities for European scientists and engineers (not least through the CoSTaR facility); and acting as the European branch of the Global Alliance convened by INAP.

Additional Key Words: acidity, best practice, Europe, guidelines, INAP, mining, training.

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Why PADRE?

Acidic drainage is now recognized to be the single greatest environmental challenge facing the mining sector worldwide. In Europe there are hundreds of examples of acidic drainage in areas ranging from the high Arctic to circum-Mediterranean deserts. Given the long history of mining in Europe and the relatively low level of current mining operations, it is not surprising that most European examples of acidic drainage are associated with abandoned mine sites.

A number of dramatic pollution events associated with abandoned mines have served to bring the issue of mine drainage management to the attention of European policy makers. Firstly, the January 1992 outburst of some 50,000 m³ of acidic, highly metalliferous mine waters from the (then recently abandoned) Wheal Jane tin mine (Cornwall, UK) gave rise to a spectacular orange plume in the Fal Estuary and the western approaches of the English Channel (Younger *et al.* 2005). In April 1998, failure of a large tailings dam at Aznalcóllar (southwestern SW Spain) resulted in around 3 Mm³ of pyrite-rich sludge filling the floodplain of the Río Guadiamar, impacting on an internationally important nature reserve. In January 2000, a tailings dam at Baia Mare in Romania failed, releasing 100,000 m³ of cyanide-rich mineral processing effluent into an upper tributary of the Danube river system, through which the plume of polluted water flowed, devastating fish stocks. In response to these events, the European Union (EU) launched a policy process which, *inter alia*, included the preparation of a draft Mine Waste Directive (Kroll *et al.* 2002).

During the development of this policy process, a string of EU-funded international research projects were undertaken, addressing issues of passive remediation of acidic drainage (PIRAMID project; www.piramid.org) and management of catchments affected by mining activities (ERMITE project; www.minewater.net/ermite). These two R&D projects supported the development of a network of acidic drainage researchers within Europe, who are in turn linked to many other researchers and practitioners throughout Europe. As acidic drainage research and remediation practices mature throughout Europe, it is desirable that the momentum generated by these projects and the parallel policy process is maintained. A central 'watching post' is desirable in order to avoid unnecessary duplication of effort; clearly this has to take an inter-continental perspective. PADRE has been established to meet these needs.

What is PADRE?

PADRE is a non-governmental, non-profit, scientific and technical organization, formally constituted as a regional 'Commission' of the International Mine Water Association (IMWA; www.imwa.de), under the terms of the IMWA statutes and Bye-Laws. PADRE was established by a decision of the Executive Council of IMWA in October 2003, endorsed by the IMWA General Assembly. As a permanent IMWA Commission relating specifically to Europe, PADRE was required to develop its own objectives, statutes and bye-laws in harmony with those of IMWA itself.

PADRE Objectives

The objectives of PADRE are to:

1. Promote international best practice in the stewardship of waters and soils on European sites subject to the generation and migration of acidic drainage.

2. Foster collaborative, international research and development into techniques for characterization and abatement of acidic drainage in Europe.
3. Promote dissemination of knowledge of current best-practice and innovations relating to acidic drainage prevention and remediation, with particular reference to European conditions, including the evolving framework of relevant EU legislation.
4. Advance the training of present and future generations of European professionals who will engage in the art and science of acidic drainage prevention and remediation.
5. Actively collaborate with a Global Alliance of organizations based in other continents which share similar objectives, which has been convened by INAP.

PADRE Membership

PADRE has two principal categories of members: voting and non-voting. Voting Members include:

- Individual members: individual persons professionally engaged in mine water problems, but not being an employer in this field.
- Corporate members: institutions, industrial companies, firms, universities, research institutes, and other organizations which wholly or partly are involved in mine water problems.
- European members of IMWA

Non-voting Members of PADRE include:

- student members (maximum age 25 years)
- individuals who are interested in participation in PADRE or IMWA Congresses or to obtain the publications but not having any influence on the Partnership activity
- International Organizations with allied interests.

Management of PADRE

PADRE is managed by an Executive Committee, comprising the Chairperson, Vice-Chair and Treasurer (a combined single position), General Secretary and two members without portfolio. This committee meets at least annually (typically six-monthly) to evaluate prior activities and plan new activities, originating from both the Committee members themselves and the wider membership. It is planned that the membership of the Executive Committee will be replaced at three yearly intervals by electronic voting.

The main dissemination tool of PADRE is the IMWA Journal "Mine Water and the Environment", which is published quarterly by Springer.

Activities of PADRE

Early activities of PADRE focused on the promotion of the ERMITE guidelines (see Younger and Wolkersdorfer (editors) 2004). It also sought to disseminate the PIRAMID guidelines (PIRAMID Consortium 2003), and to disseminate advanced course notes published in the wake of the European training course on "Groundwater Management in Mining Areas" (Pécs, Hungary in June 2003) organized by the FP5 IMAGE-TRAIN project. PADRE also hopes to ensure the future updating of the ERMITE and PIRAMID guidelines in the light of new research findings, and to encourage the emergence of other forms of 'best

practice' guidance, for instance in relation to pit lake management (e.g. Bowell 2002) and EIA practices for the mining sector (e.g. Kuma *et al.* 2002).

Forthcoming activities include development of plans to submit a substantial multi-partner proposal to the European Commission's "Know-how Fund" with the aim of securing funding to facilitate holding an "Acidic Drainage Master Class" at various locations throughout Europe over the next few years.

Last but by no means least, PADRE is acting as the European hub for the Global Alliance convened by INAP, and is participating with enthusiasm in the development of a proposal for global ARD prevention guidelines.

Conclusions

PADRE has been established as a permanent commission of the International Mine Water Association (IMWA), with the aim of fostering best practice, based on the latest research, in the remediation of acidic drainage from active and abandoned mine sites throughout Europe. PADRE activities include: maintaining best practice guidelines on passive remediation (the PIRAMID Guidelines) and catchment-scale mine water management (the ERMITE Guidelines); developing further sources of guidance; implementing training and professional development activities for European scientists and engineers (not least through the CoSTaR facility); and acting as the European branch of the Global Alliance convened by INAP.

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